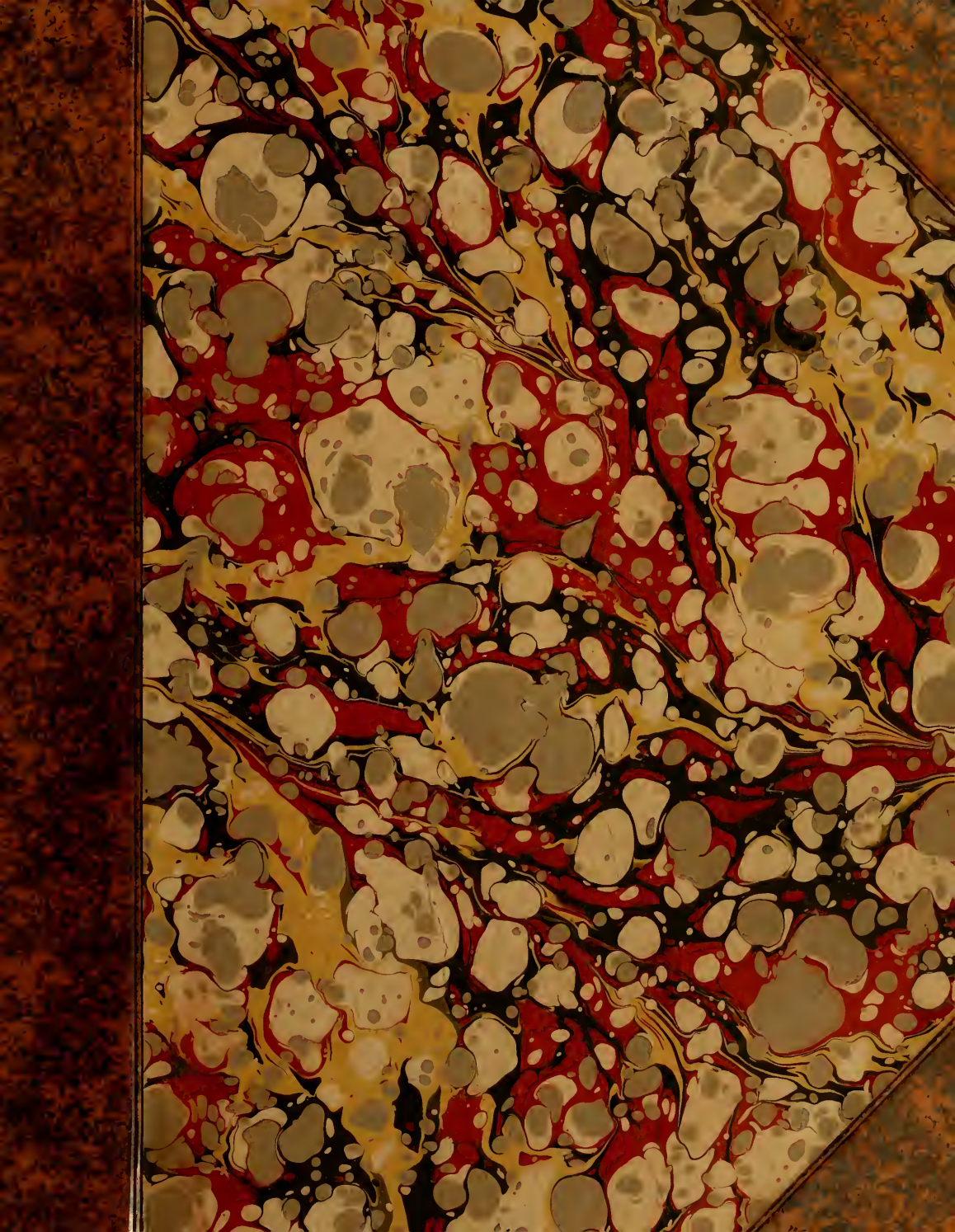

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THE

PRACTICAL BUILDER,

OR

WORKMAN's GENERAL ASSISTANT:

Shewing the moſt approved and eaſy METHODS for DRAWING and WORKING the whole or ſeparate PART of any BUILDING, as

The Uſe of the TRAMEL for GROINS, ANGLE-BRACKETS, NICHES, &c.

Semi-circular ARCHES on Flewing JAMBS, the preparing and making their SOFFITS.

RULES OF CARPENTRY;

To find the LENGTH and BACKING of HIPS, ſtrait or curved; TRUSSES for ROOFS, DOMES, &c.——Truſſing of GIRDERS, SECTIONS of FLOORS, &c.

The Proportion of the Five Orders, in their general and particular Parts, Gluing of Columns, STAIR-CASES with their *ramp* and *twiſt* RAILS, fixing the CARRIAGES, NEWELS, *&c.*

Frontiſpieces, Chimney-Pieces, Ceilings, Cornices, Architraves, &c. in the neweſt Taſte.

With Plans and Elevations of Gentlemens and Farm-Houſes, Yards, Barns, *&c.*

By WILLIAM PAIN, ARCHITECT and JOINER.

Engraved on Eighty-three PLATES.

LONDON: PRINTED for I. TAYLOR, at the BIBLE and CROWN, in HOLBORN, near CHANCERY-LANE,
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PREFACE.

CONſidering the Number of Books on the Theory and Practice of Architecture already publiſhed, any further Effort to illuſtrate and familiarize this MOST NOBLE ART, may ſeem ſuperfluous and unneceſſary; in me eſpecially, who, by two former Publications, endeavoured to advance the young Practitioner in the Knowledge of his Profeſſion.

But as Art is improving, greater Experience enables to diſcern the truly uſeful, and thereby to confirm or reject former Methods.

The very great Revolution (as I may ſay) which of late has ſo generally prevailed in the Stile of Architecture, eſpecially in the decorative and ornamental Department, will evince the Neceſſity and eminent Utility of this Publication. That Taſte (ſo conſpicuous in our modern Buildings) which is vainly ſought in any other practical Treatiſe, the Workman will here find illuſtrated in a great Variety of uſeful and elegant Examples.

The Deficiencies and confined Plans of thoſe Books now uſed by Workmen, is another Inducement to collect together in one View, the moſt eaſy and certain Rules to carry on the Building Art. Theſe are the Reſult of Experience, and by the Author long uſed in conducting Buſineſs, who now offers the Public a general practical Treatiſe, wherein his great Care has been plainly and faithfully to anſwer the Purpoſe of the manual Artificer: It is not meant to inſtruct the profeſſed Artiſt, but to furniſh the Ignorant, the Uninſtructed, with ſuch a comprehenſive Syſtem of Practice, as may lay a Foundation for their Improvement, and thereby enable them to execute with Eaſe and Preciſion, the various Branches of the Profeſſion.

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A *TABLE* for the Cutting of Timber for Building.

Bearing Poſt.

Height.	
If 8 Feet	9 Inch. ſquare
— 10 —	10 by 9
— 12 —	11 — 12
— 16 —	14 — 15
— 20 —	16 — 18

Girder's Bearing.

If 10 Feet	10 by 9 In.
— 12 —	11 — 10
— 14 —	12 — 11
— 16 —	12 — 13
— 18 —	13 — 14
— 20 —	15 — 14
— 24 —	15 — 16
— 30 —	16 — 18

Binding Joiſts.

Bearing	Inches
6 Feet	6 by 4
8 —	7 — 4
9 —	8 — 4
12 —	10 — 5

Bridging Joiſts.

Whoſe Bearing ſhould not exceed 5 Feet, and Scantling not leſs than 6 by 4.

Common Joiſt.

Bearing	Inches
6 Feet	6 by 3
9 —	9 — 3
12 —	12 — 4

Beams or Ties.

Length	Inches
12 Feet	7 by 8
16 —	8 — 9
20 —	9 — 10
30 —	10 — 11
40 —	12 — 11
50 —	13 — 12

Small Rafters.

Bearing	Inches
8 Feet	5 by 3
10 —	7 — 3
12 —	8 — 4

Principal Rafters.

Length	Bot^m.	Top.	Thick.
From 12 to 16 Feet	8	6	5
From 16 to 20 —	9	7	6
From 23 to 24 —	10	8	7
From 24 to 30 —	12	10	9

Purlins from 8 by 5 to 9 by 7 or 10 by 8.

Raiſing Plates from 7 by 5 to 8 by 6, or 10 by 8.

Ground-ſills the ſame as Raiſing Plates.

To face PLATE I.

Figure *A* and *B* are ribb'd NICHES for Plaiſtering.

THE Plan *a* is a Semi-Elipſis on the tranſverſe Diameter, which is drawn with a Tramel as repreſented in the Plan, which is to be made with a Grove at Right Angles as in the Figure; two Pieces to be morticed to ſlip on the Rod, and one fixed at the End for a Pencil, &c. fix one of the Pieces equal to half the Conjugate Diameter, and the other to half the Tranſverſe Diameter, and moving the Rod with the Pins in the Groves, the Pencil will deſcribe the Semi-Elipſis.

To draw the Elipſis *c* to any given Length and Breadth, take half the Conjugate Diameter *a b* and ſet it on the Tranſverſe Diameter *d c* divide *c a* into three equal Parts, and make *c e* equal to one of thoſe Parts, and with the Radius *e f* biſect *g g*. So the Points *e f* and *g g* are the Centres for drawing the Elipſis to any Length and Breadth.

To draw the Elipſis *d* with a Line, take half the Tranſverſe Diameter *b a* and ſet it from *c* on the Conjugate Diameter to *d* on the Tranſverſe Diameter, and to *e* on ditto, then *e d* are the Points to be fixed for the Line to go round, which will deſcribe the Elipſis with the Point *f*.

To glue the Head of a Nich as Figure *e*, cut the Arch Part of the Board or Stave to the Thickneſs of a Veneer, and bend it on a Templet, and back it to the Curve, it may be jointed the ſame as a Column, &c.

To deſcribe a Polygon to a given Side from five to eight Sides, make a Radius of the given Side for the Pentagon, divide the Arch into five Parts, turn one down on the Line which is the Centre, to deſcribe a Circle which will contain the Side five Times.

For a Hexagon, the Radius of the Side is the Centre.

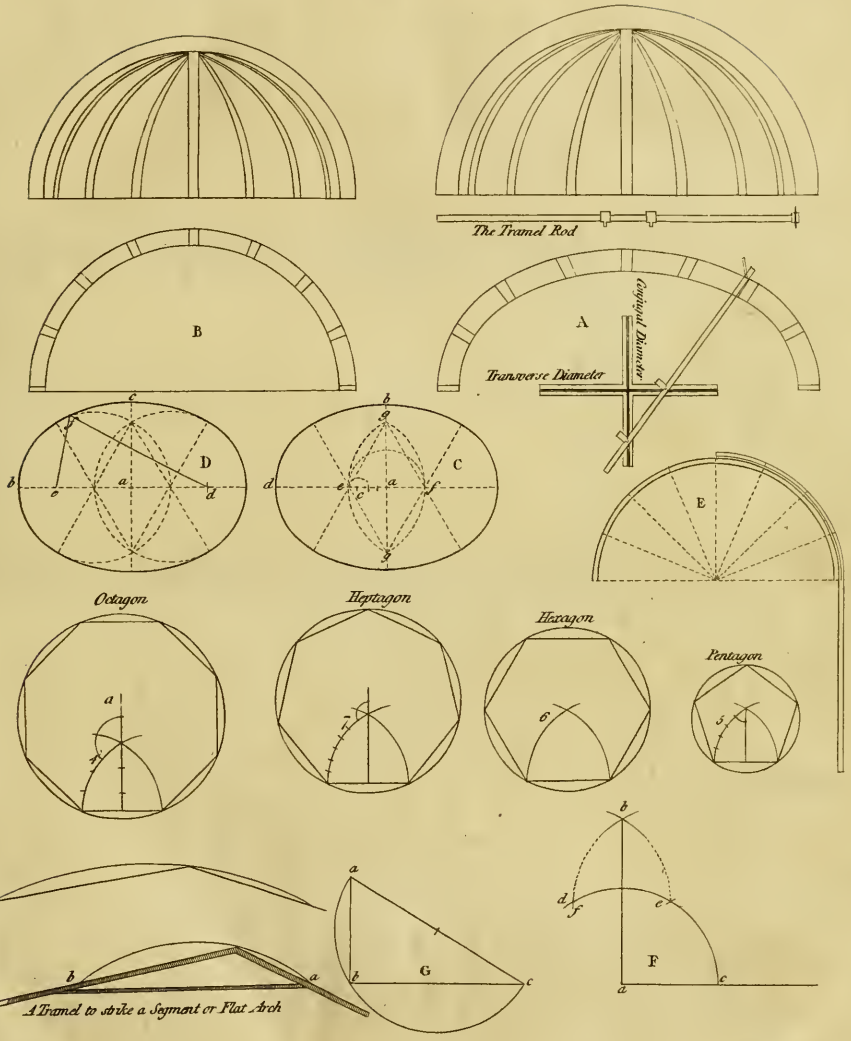
The Heptagon into ſeven Parts and turn one up.

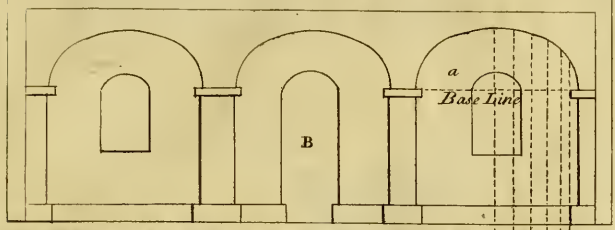
The Octagon into four and turn one up.

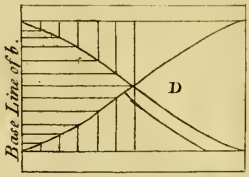
To raiſe a Perpendicular at the End or Middle of a Line. Deſcribe the Arch *c d*, and with the Radius *a c* make *e f*, which biſect at *b*, gives the Perpendicular to *a*.

To let fall a Perpendicular from a given Point to a Baſe Line. Figure *G*; let *a* be the Point given to fall to the Baſe Line *b c*, draw a right Line from *a* at pleaſure to meet the Baſe Line as at *c*, more or leſs; divide the Line *c a* into two Parts, and draw the Semi-Circle *a b c*, and where the Circle cuts the Baſe Line at *b*, which is at Right Angles with *a*, which was to be done.

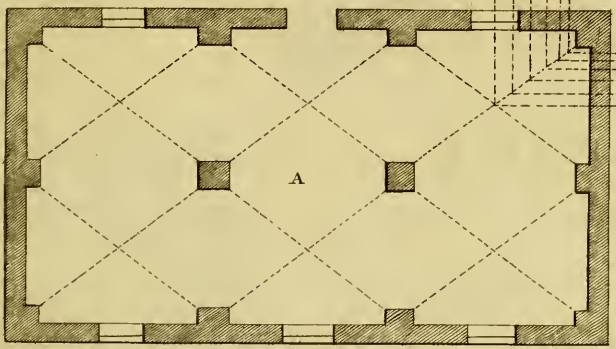
Niches, Polygons, Tramels &c.







The Arch line of a, Stretched out at lenght.



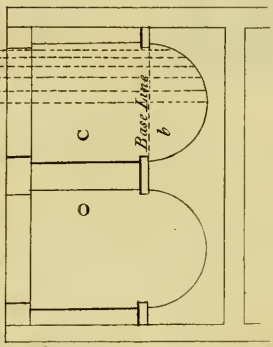
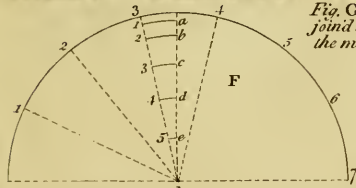
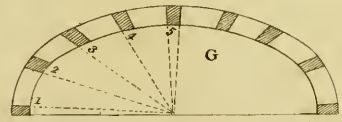
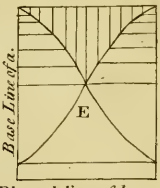


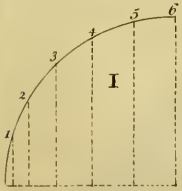
Fig. G, is a Ribb'd Nich for plaistring with the Ribs all joind to ŷ place where to stand the Edges are Bevel so the mould must be shifted.







The arch line of b. Stretched out at lenght.



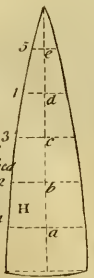


Fig. F, is a plan of Nich to be fineered H, is the fineer stretched out at lenght from ŷ Arch I, & 2 F, is ŷ plan which ŷ edges are traced from, which is plain to Inspect. but the more parts it is divided into the truer the Round. the plan is in 7 parts but in practice it may be into 15 parts or more at pleasure.

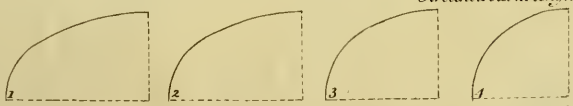


Fig. A, is a Plan of a Cellar Ground in B & C are the Sections which shew how the hip is traced to make the Angle streight over ŷ plan D and E, are the covering or face of the Groins stretched out from which a mould may be made to make the hip or Angle streight if the Ribs C, O, are set first & boarded in the mould must be taken from E, but if the Arches in Section B, be set first the mould must be taken from D.

Fig. B. is an Arch standing on Flewing Jambs in a Straight Wall and supposed to be a fair Arch in Stone or Brick. Divide the Round of the Arch in as many Parts as are Courses to Compleat the Arch and drop them to the Wall Line, then Draw them cross the Wall, Parallel with the Jambs, and that shews how much is to be Cutt of the Face of each Course.

Circular Arches &c. in a Circular Wall.

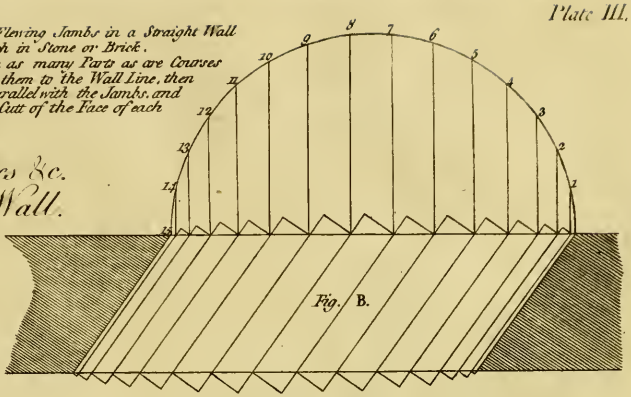
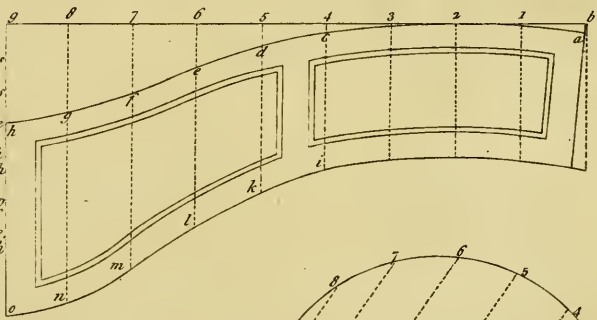


Fig. B.

Fig. A. is a Circular Wall which has a Door or Window that stands Flewing. Because the Jambs do not stand at Right Angles with the Diameter of the Circle, as in Plate IV find the Curve Line of the Soffit. in this Case draw the Cord Line or Base Line of the Arch. o, g at Right Angles with the Jambs o.h to touch the Arch of the Wall at a, and Divide the Arch into equal Parts and drop them to the Wall then take of the Distances, h, g. 8.g. 7.f. 6.e. &c. and put them on the Arch stretch'd out. Gives the edge of the Soffit.



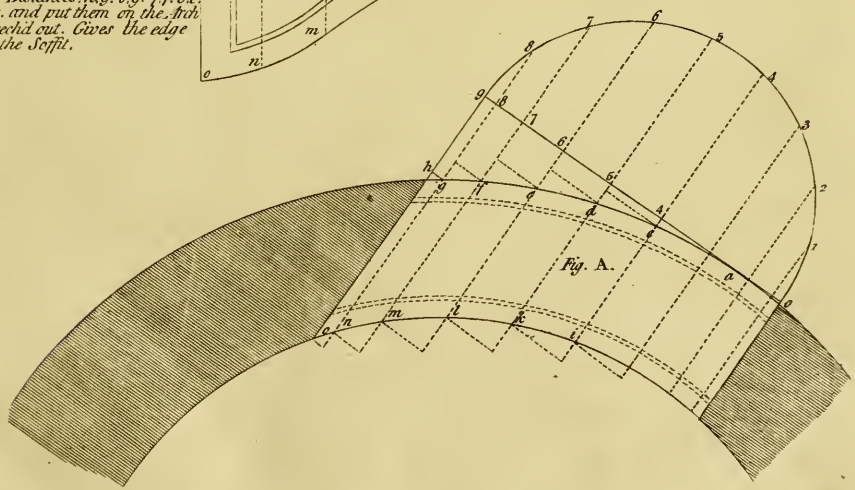


Fig. A.

To face PLATE IV.

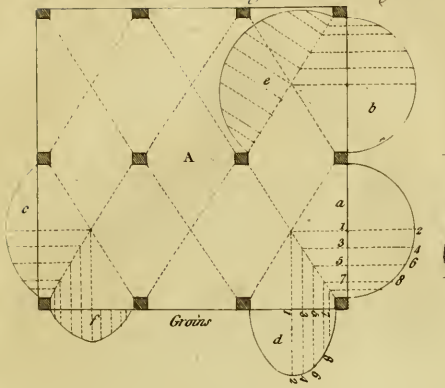
Figure *A* is a PLAN to be GROIN'D.

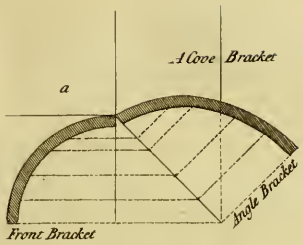
DIVIDE the Baſe Line *a* of the given Rib into equal Parts, and that of *d* into the ſame Number of Parts, and draw Lines to the Arch Line of *a*, and likewiſe in *d* at pleaſure; then take 1, 2, 3, 4, 5, 6, &c. from *a*, and transfer them to *d*, as 1, 2, 3, 4, 5, 6, &c. and thro' the Point 1, 2, 4, 6, 8; trace the Arch Line over *d*, and ſo for the Reſt, as is plain to Inſpection. The Angle Bracket is done in the ſame Manner.

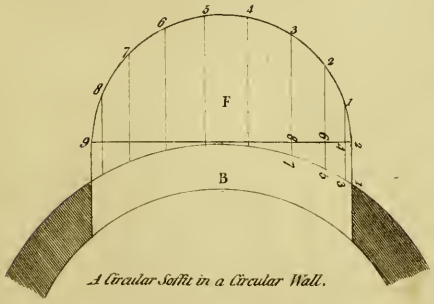
To deſcribe a Circular Soffit in a Circular Wall, as in *B*. Draw the Cord Line of the Arch, or Baſe Line ſo called, to touch the Arch of the Wall, then draw the Semi-Circle and divide the Round of it in a Number of equal Parts as here into 9, but the more Parts the truer the Work, and draw them to the Arch of the Wall, then ſtretch out the Arch Line at Length as in *e*, and transfer the Parts that are between the Wall and Baſe Line, as 1, 2, 3, 4, 5, 6, *&c.* to *e*, which gives the Edge of the Soffit or Pannel.

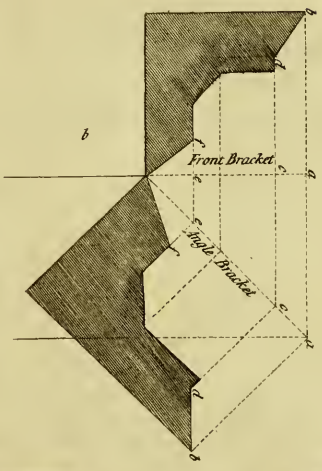
To deſcribe a Circular Soffit in a ſtrait Wall on flewing Jambs. Continue the flewing of the Wall till it meets at *b*, then ſet the Compaſſes at *b*, and draw two Arches to the Thickneſs of the Wall, then put on the Girt of the Soffit *c d*, which gives the Length of the Soffit and Edge of ditto.

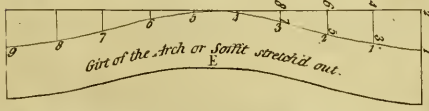
Groins. Angle Brackets &c.

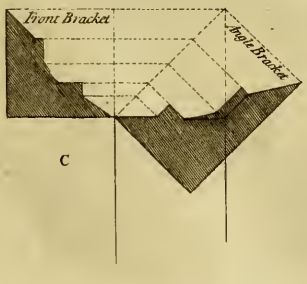


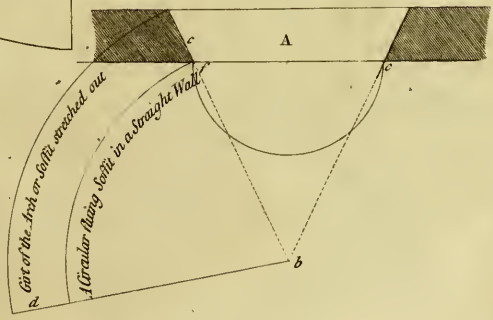




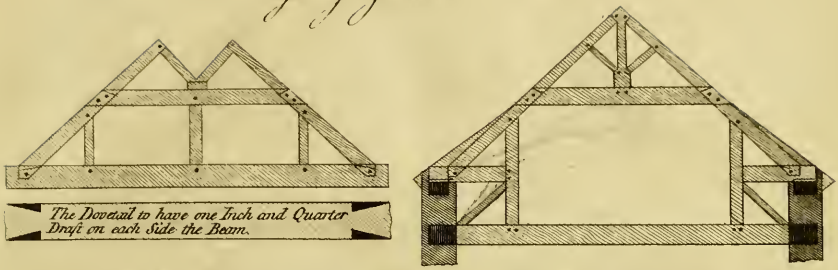






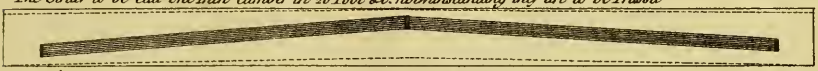


Trussing Girders Floors &c.

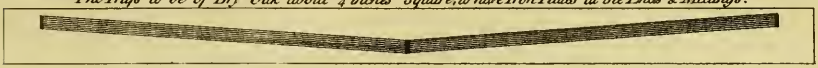


The Dovetail to have one Inch and Quarter Dryft on each Side the Beam.

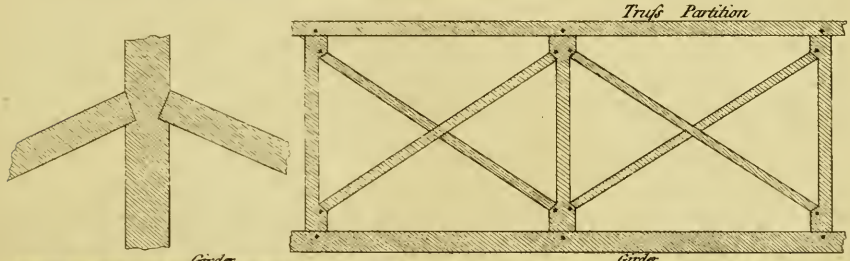
The Girder to be Cutt one Inch Camber in 20 Foot &c. notwithstanding they are to be Trussd



The Truſs to be of Dry Oak about 4 inches Square, to have Iron Plates at the Ends & Meetings.



Truſs Partition



Girder

Binding Joist

Section of a Bridge Floor

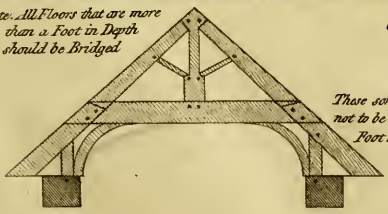
Girder

Binding Joist

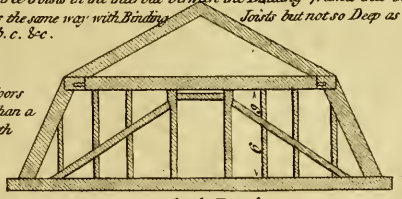
Section of a Floor with the Binding Joist the whole Depth.

Note. All Floors that are more than a Foot in Depth should be Bridged

with three Joists in the interval between the Binding framd into the Girders the same way with Binding Joists but not so Deep as ditto as a.b.c. &c.



These sort of Floors not to be more than a Foot in Depth



Curb Roof.

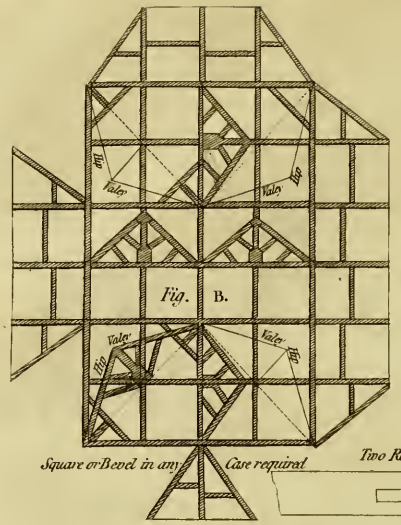
To face PLATE VI.

Figure *A*. Plan and Ledgment of a Roof, ſhewing how to find the Length and Backing of Hips, Valley, &c.

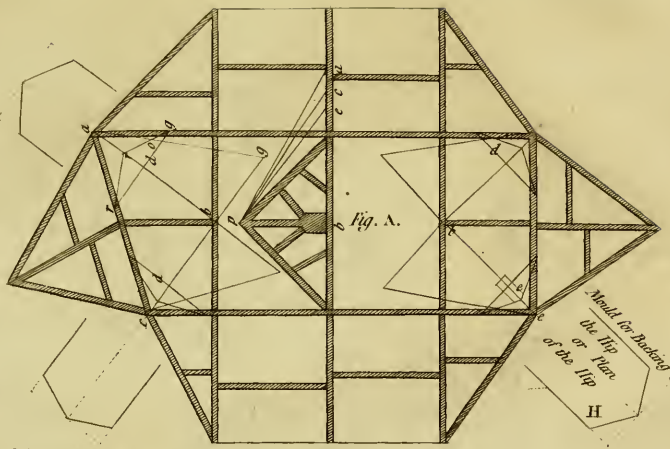
TO find the Length, take the Baſe Line of the Hips *a b*, *b c*, and *b e*, and ſet them on the Baſe Line of the principal Rafters, as *b a*, *b c*, *b e*, and draw Lines from the Top of the Rafter to *a c e*, which is the Length of each Hip. Or the Length may be found by ſetting up the Perpendicular from the Baſe Line of the Hips, as *b g*, and draw the Line *g a*, is the Length of the Hip. To Back the Hip, lay down the Thickneſs of the Hip at the Angle of the Plan, as *H*, and draw Lines to range the Plates, will ſhew how much Wood is to come off in the Backing; that is, the Mould muſt be a Piece of Wood as thick as the intended Hip, and cut it to the Splay or Pitch of the Hip at the Foot, ſetting it on the Angle of the Plate in the Direction of the Hip, mark it under by the Side of the Plate; gives the true Backing in any Caſe required. A very ſure and ſafe Way for the Backing.

Figure *B* is the Plan of an M Roof, with Hip and Valley in Ledgment, &c.

Note, The Back of the Hip is found another Way, as in the Plan *A*. by drawing a Line at Right Angles, croſs the Baſe Line of the Hip, as *r d g*, or on any Part of the Baſe Line, and ſet one Foot of the Compaſs at *d*, and extend to the neareſt Part of the Hip *g a*, and turn it on the Baſe Line, as at *r*, then draw the Lines from the Point *r* to *g r*, on the Edge of the Plate, which is the Backing of the Hip required. This will do in any Caſe, ſquare or bevel.

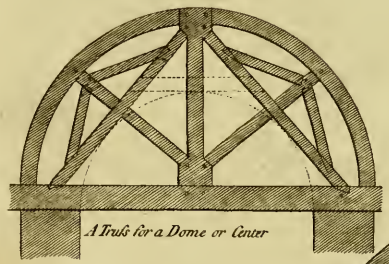


Square or Bevel in any Case required

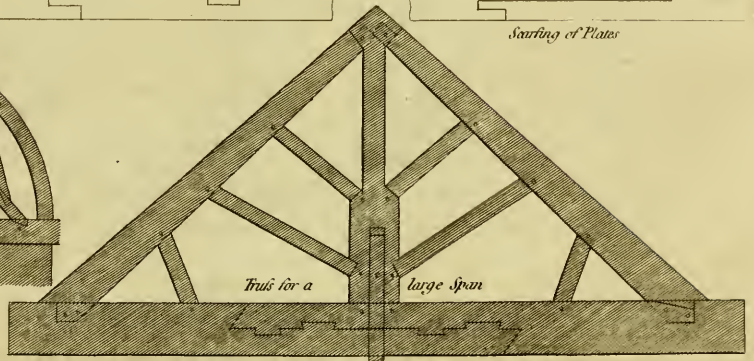


Two Roofs in Ledgement shewing how to find the Length and Backing of Hips

Scarfing of Plates

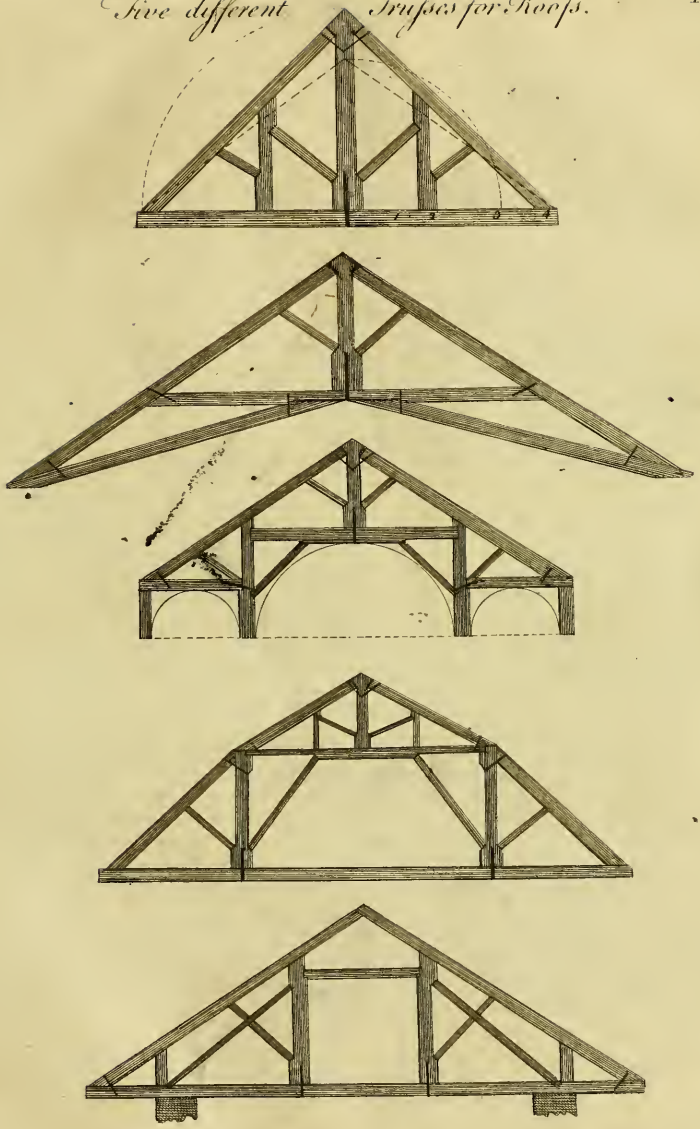


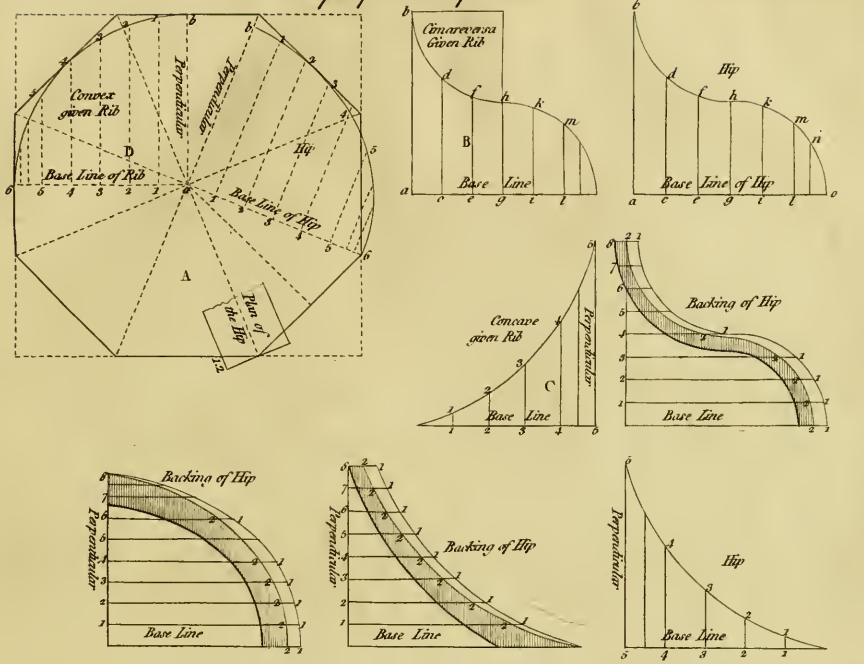
A Truss for a Dome or Center



Scarfing of Beams

Five different Truſſes for Roofs.





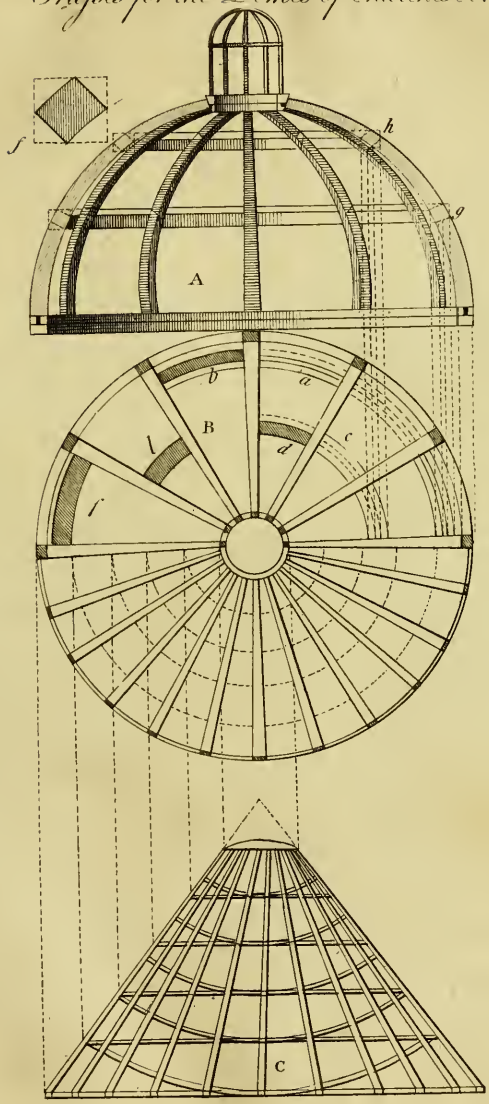
The manner of finding the Length and Backing of Curve Line Hips in any Case required. Suppose the Octagon. Plan A. to be Roofd with the Cimareversa B. or the Concave C. or the Convex D. in the Plan. Divide the Base Line of the given Rib into any number of equal Parts and draw Lines from those parts on the Base Line to the Back of the Rafter. a b, c d, e f, g h, i k, l m, and all the others as 1 1, 2 2, 3 3. and so on. Then the Base Line of the Hips must be divided into the same number of Parts and Lines drawn up at Pleasure as a b, c d &c. from the Base Line of the Hips, then take the several Heights of the given Ribs and set them on the Hip Lines. then trace them through those Points b d, f h, k m, n o. that will give the Curve or Edge of the Hip and the same for all the others and for the Backing of the said Hips there is a Plan of the Hip at the Angle of the Plan A. which shews how much Wood is to be Cutt off each side of the Hip. Divide the Perpendicular Height of the Hips into any number of equal Parts, and draw Lines Parallel with the Base Lines of the Hip. Then take the Distance from the Plan of the Hip to the Side of the Plan A. as 1 2 and put them on the Hips, as 1 2, 1 2. &c. which gives the true Backing in any Case required. Note when the parts are Set on at Bottom and Top of the Hip the Mould may be shifted and markid which shews the Wood to come off.

To face PLATE IX.

Truſſes for the Domes of Churches, &c.

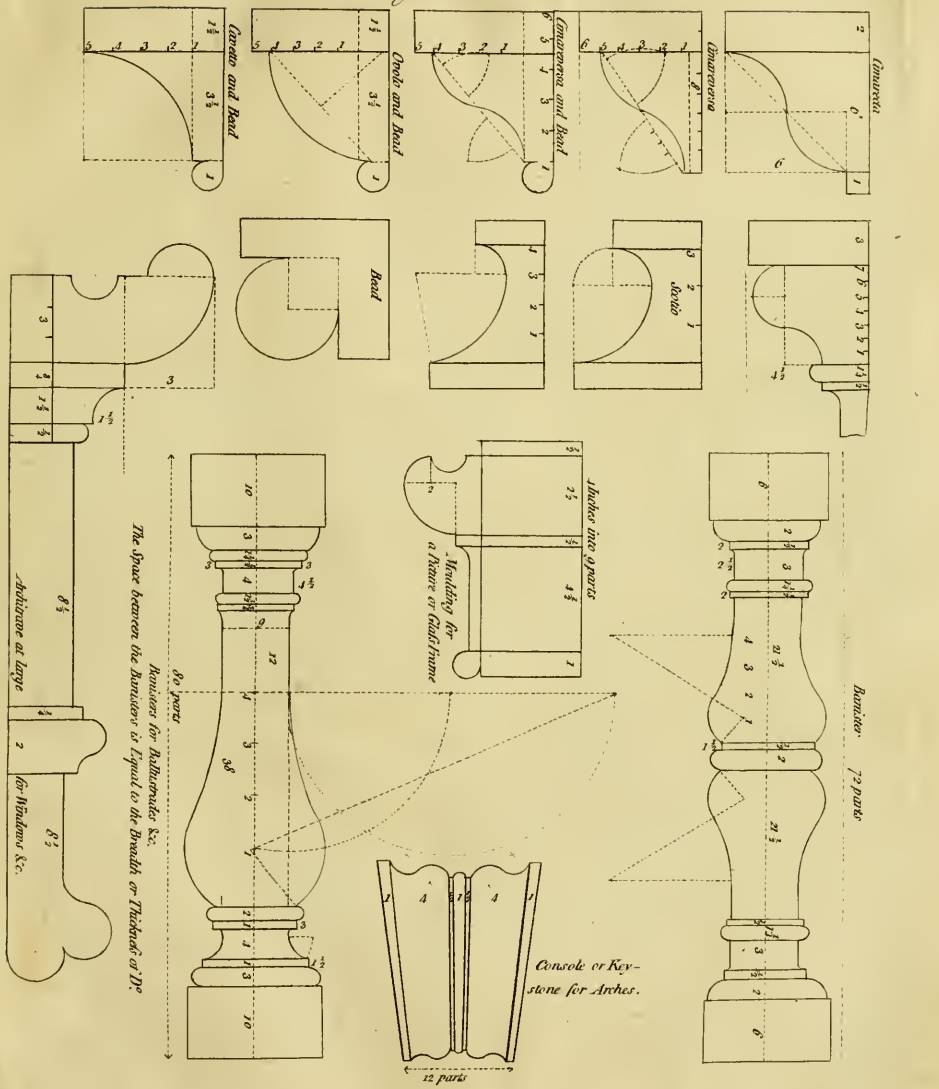
A. Is a Truſs for a Dome, with a Lanthorn or Cupola at the Top, to give Light. B. the Plan; the Kirb or Plate to be in two Thickneſſes, which is likewiſe beſt for the Ribs, and for the Kirb on which the Cupola ſtands. The Curve of the Dome A. is a Semi-circle, or will ſerve for a Semi-elipſis. The Moulds *f* and *c* in the Plan B, cut the Sweep of the Purlines; and the Moulds *b a* and *c d* are for the Top and Bottom of the Purlines. C. is a Cone or Lanthorn to light a Stair-Caſe, &c. the horizontal Bars muſt be ſquared in the ſame Manner as the Purlines in A. The Mould for cutting or ſquaring the Purlines, is like the bottom Mould *f* in B. ſo that if the Purlines be cut to the Thickneſs required as in the Section A, and alſo to the Mould *f*, then *a* is the Mould for the Bottom and *b* for the Top, as appears by the Lines let fall to the Plan B from the Purlines *g* and *h*; then C in the Plan is the Top and *d* the bottom Mould. *l* is the ſweep Mould for the Top of the Purline *h*. By this Rule the Purlines may be ſquared, which completes the Work. If the Plan B, the Ribs and Purlines are in Size and Number, as the Cone C, it will do for a Lanthorn or Light to a Stair-Caſe, &c. the Manner of ſquaring the Ribs and Croſs Bars is the ſame as the Dome.

Truſſes for the Domes of Churches &c.



Mouldings, Balustrades &c.

Plate X.



Intercolumniations for Portico's, Arcades, Colonades &c.

Regard must be had to the Number of Triglyphs, Modillions Dentels &c. between the Central lines of Columns Pilasters &c.

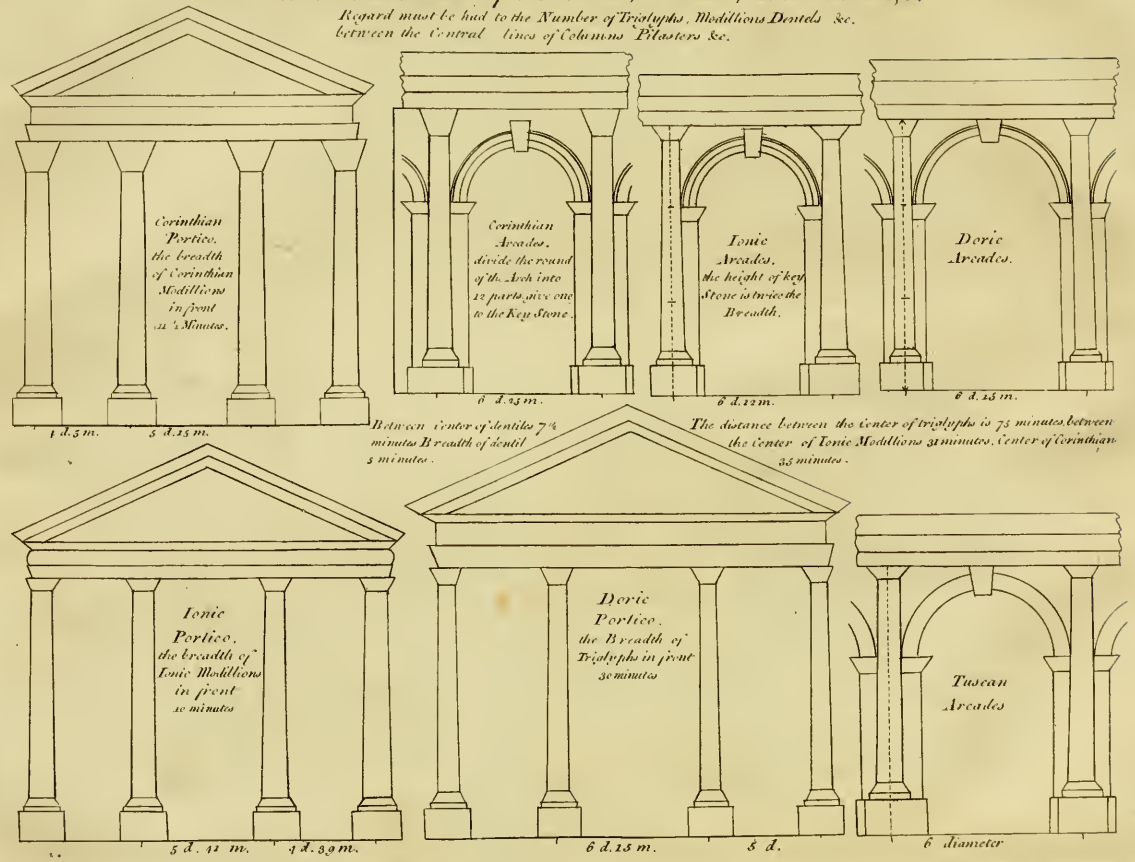
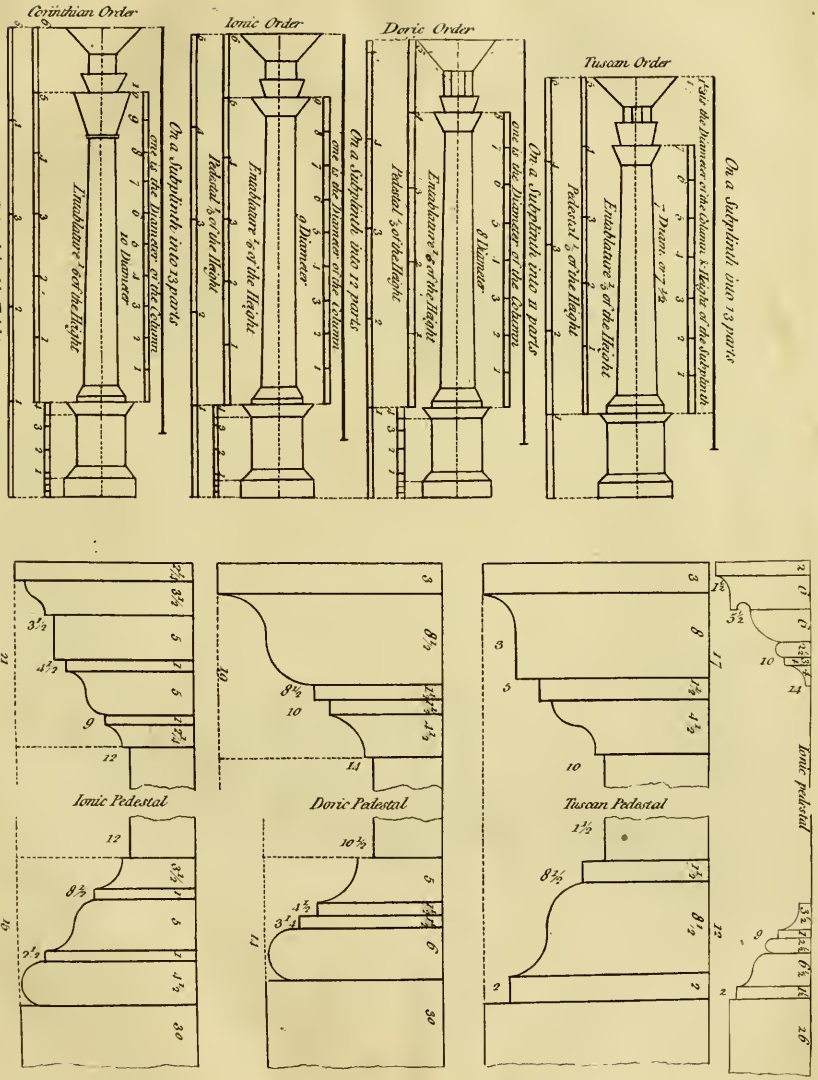
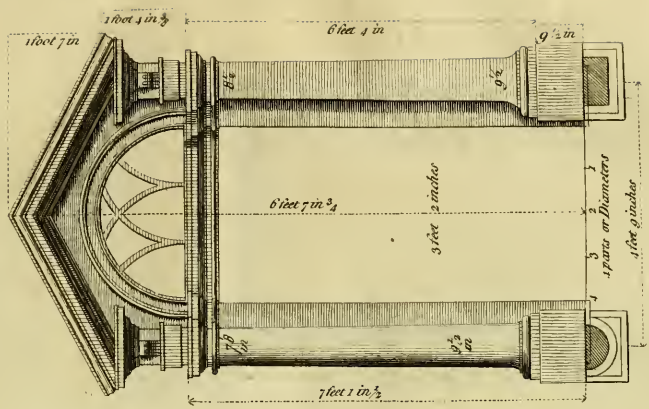

Corinthian Portico. the breadth of Corinthian Modillions in front 21 Minutes.
1 d. 5 m.
5 d. 15 m.
Corinthian Arcades. divide the round of the Arch into 12 parts, give one to the Key Stone.
6 d. 23 m.
Between Center of dentils 7½ minutes Breadth of dentil 5 minutes.
Ionic Arcades. the height of key Stone is twice the Breadth.
6 d. 12 m.
Doric Arcades.
6 d. 15 m.
The distance between the center of triglyphs is 75 minutes between the center of Ionic Modillions 31 minutes. Center of Corinthian 35 minutes.
Ionic Portico. the breadth of Ionic Modillions in front 10 minutes
5 d. 11 m.
4 d. 29 m.
Doric Portico. the Breadth of Triglyphs in front 30 minutes
6 d. 15 m.
8 d.
Tuscan Arcades
6 diameter

Plate XI

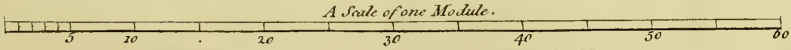

Corinthian Order
Ionic Order
Doric Order
Tuscan Order
On a Subplinth into 13 parts
Entablature ⅖ or the Height
Pedestal ⅓ or the Height
Ionic Pedestal
Doric Pedestal
Tuscan Pedestal

Frontispice in the Tuscan Order.



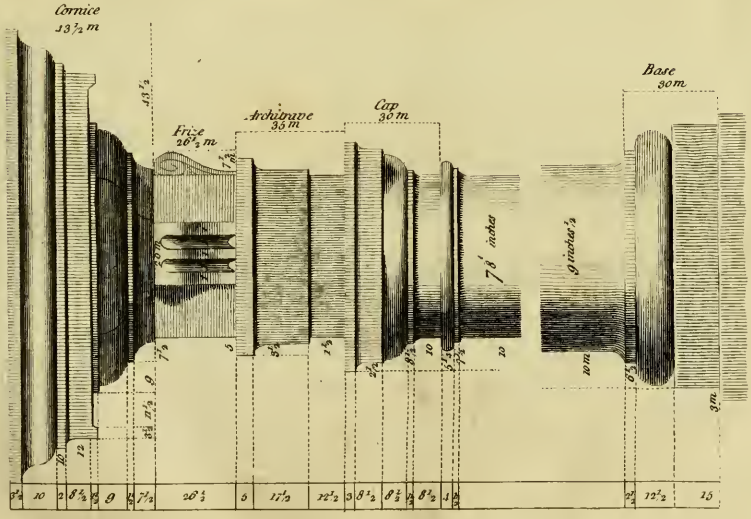
Divide the Door into 4 parts one is the Diameter of the Pilaster

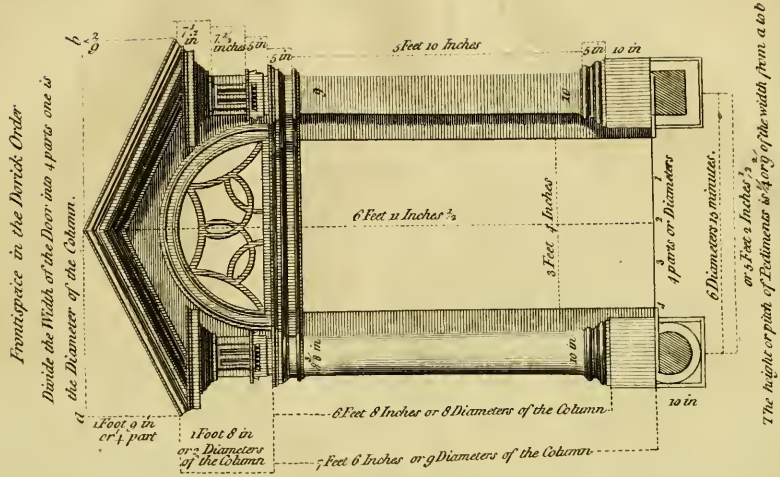
A Scale of one Module.

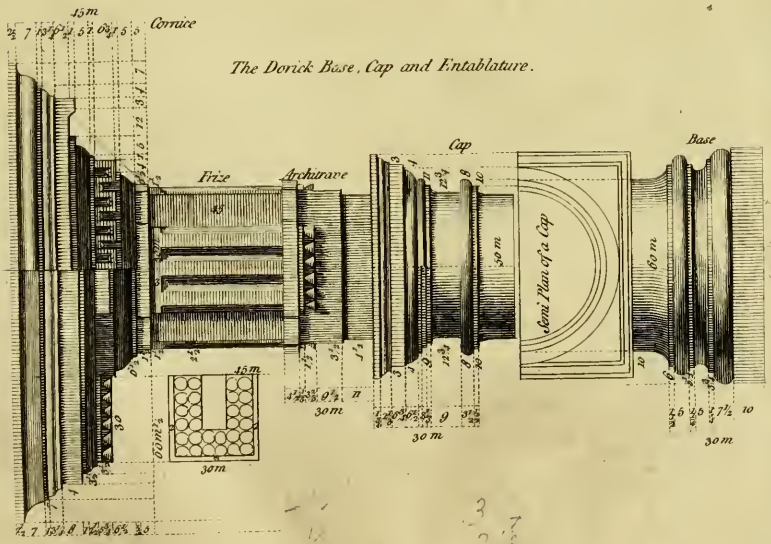


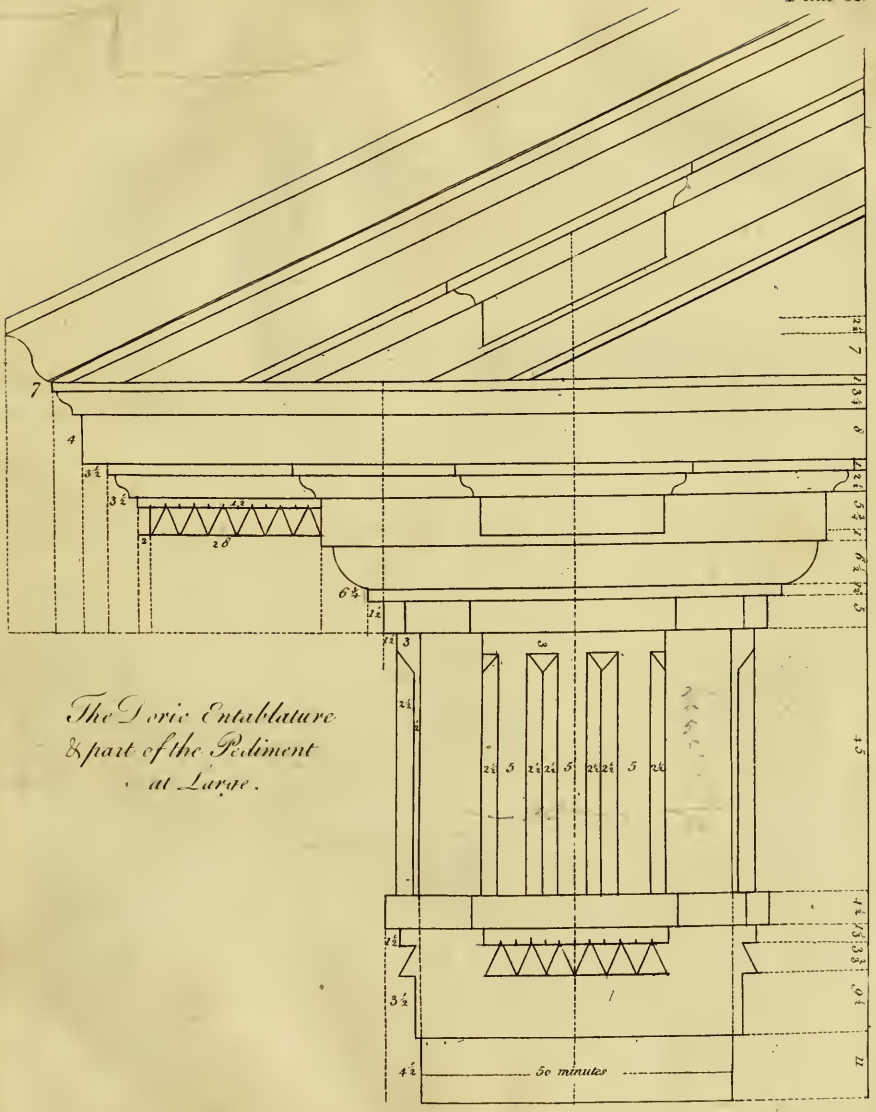
Divide the given Module into 12 parts and one of these parts into 5 gives the Minutes.

The Tuscan Entablature.

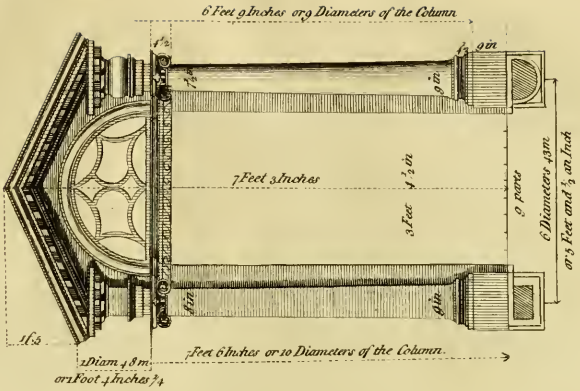



Frontispiece in the Dorick Order
Divide the Width of the Door into 4 parts one is the Diameter of the Column.
5 Feet 10 Inches
6 Feet 11 Inches 3/5
3 Feet 4 Inches
4 parts or Diameters
6 Diameters is minutes.
or 3 Feet 2 Inches 1/2
The height or plan of Pedimentis 3/4 ory of the width from a to b
6 Feet 8 Inches or 8 Diameters of the Column
7 Feet 6 Inches or 9 Diameters of the Column
1 Foot 9 in or 1 part
1 Foot 8 in or 2 Diameters of the Column


Cornice
The Dorick Base, Cap and Entablature.
Frize
Architrave
Cap
Base
Semi Plan of a Cap

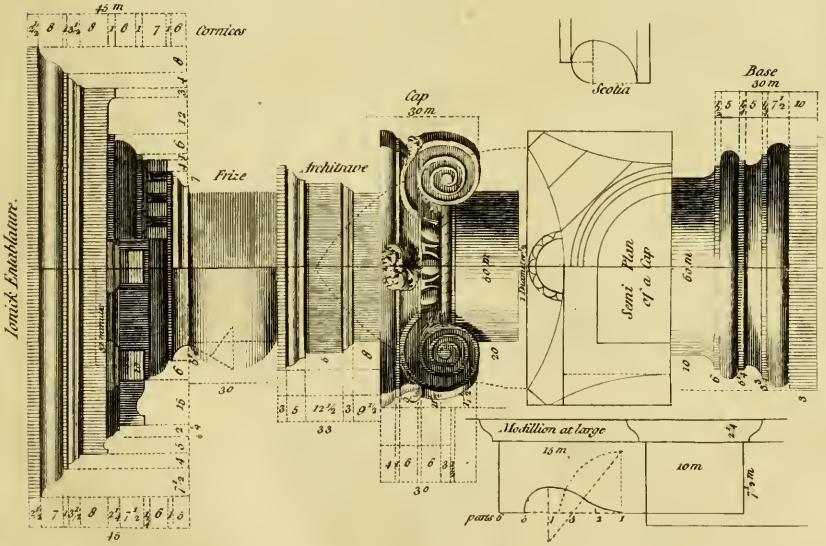


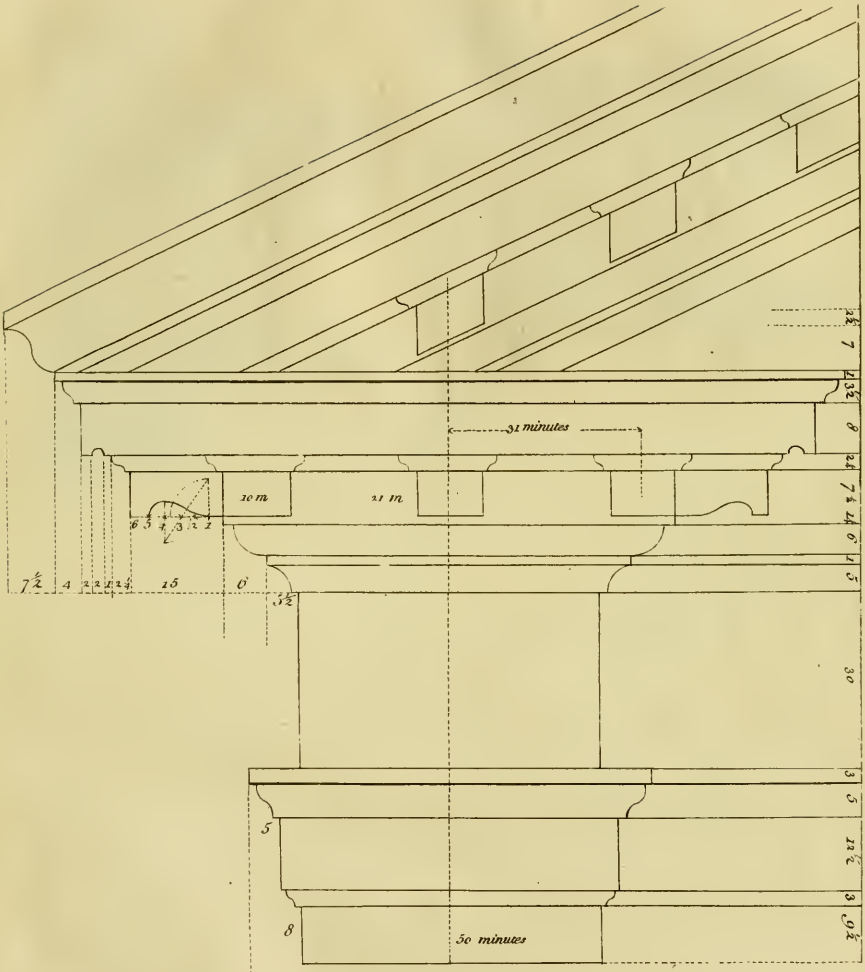
The Doric Entablature & part of the Pediment at Large.


6 Feet 9 Inches or 9 Diameters of the Column
7 Feet 3 Inches
3 Feet
9 parts
6 Diameters 43m.
or 3 Feet and ½ an Inch
7 Feet 6 Inches or 10 Diameters of the Column
1 Diam 4 8m.
or 1 Foot 4 Inches ¾

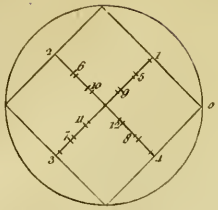
Fireplace in the Ionick Order.

19 Modillions between the Central Line of the Columns & minutes from Center to Center of the Modillions.
Divide the Width of the Door into 9 parts, each part is equal to half the Columns Diameter or 3 Inches ½.



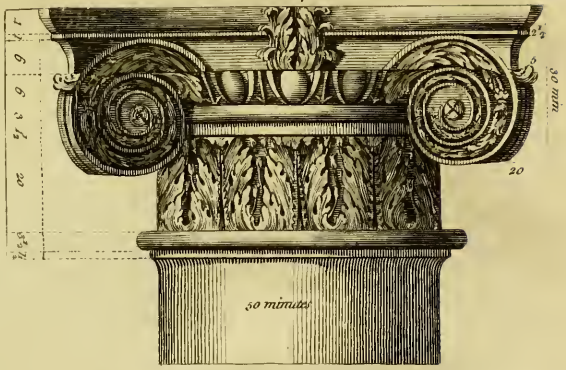


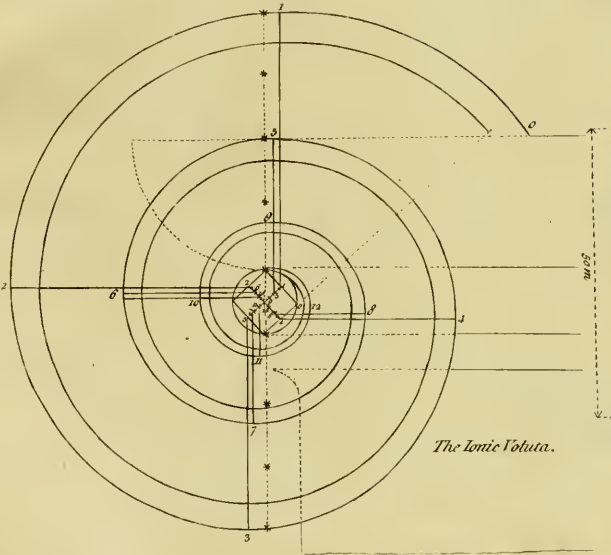
The Ionic Entablature with part of the Pediment at Large.



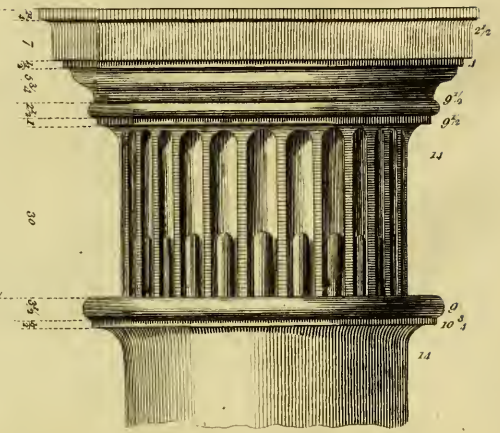
The Eye of the Voluta at large.

A Modern Ionic Capital, with Leaves





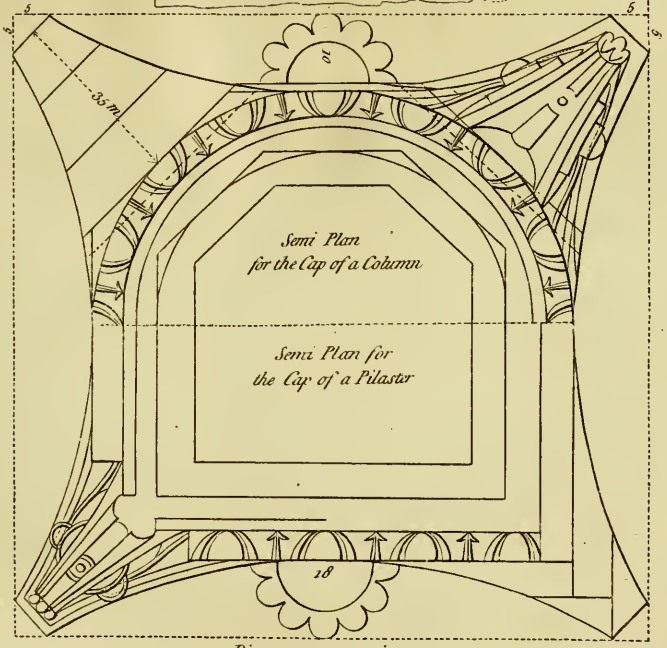
The Ionic Voluta.



A Composed Cap for a Column.

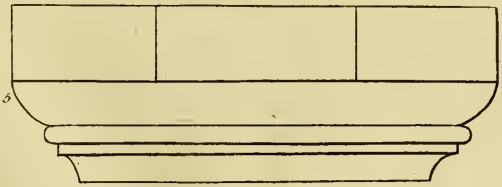
Plate XVIII

Ionic Capital in Front and Profile with all the Parts figured.

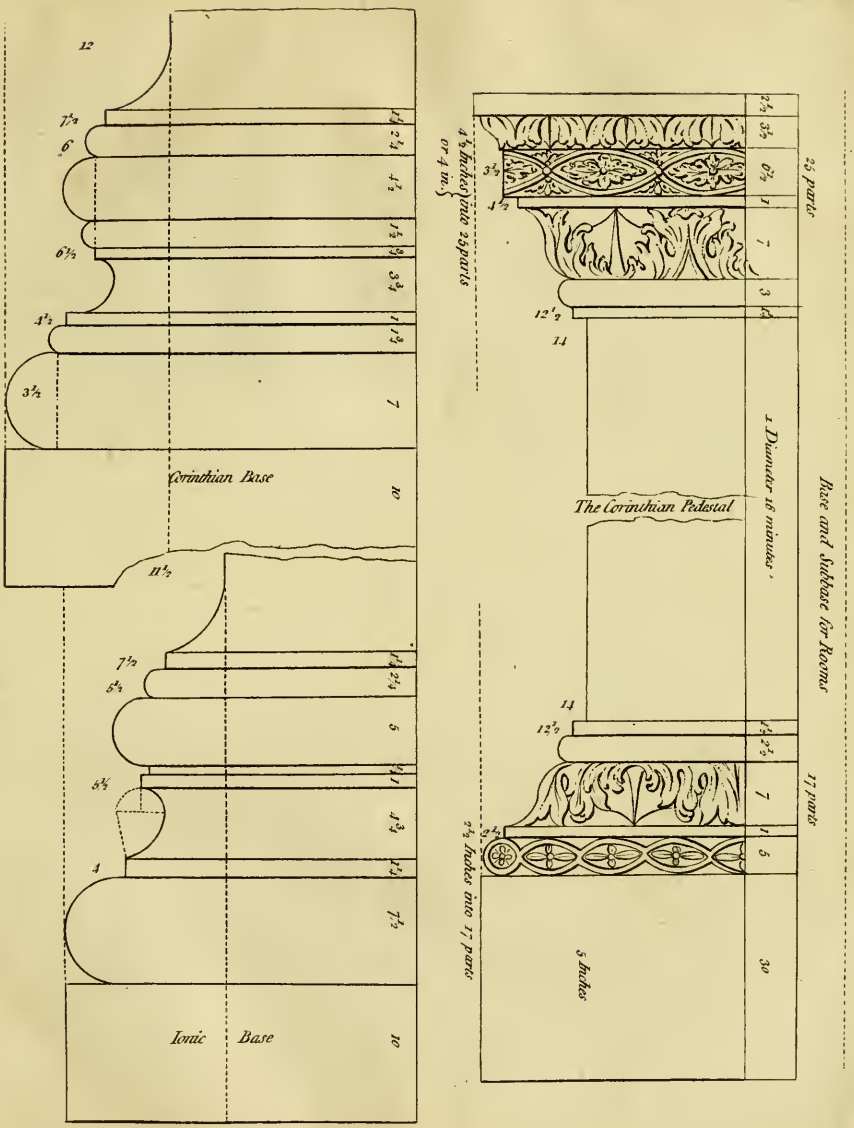


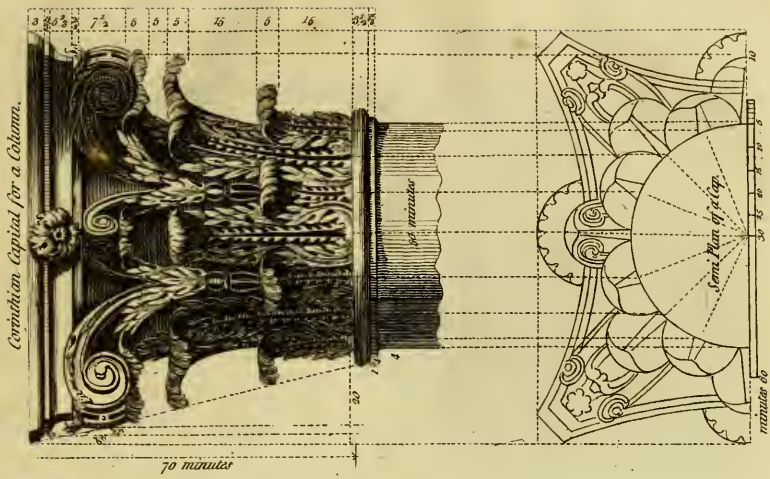
1 Diameter 30 minutes

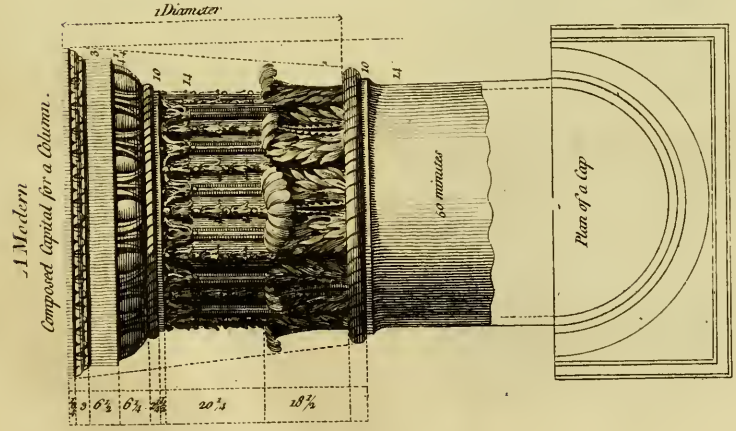
The Body of the Cap with the Mouldings worked before the Horns are Glued on.

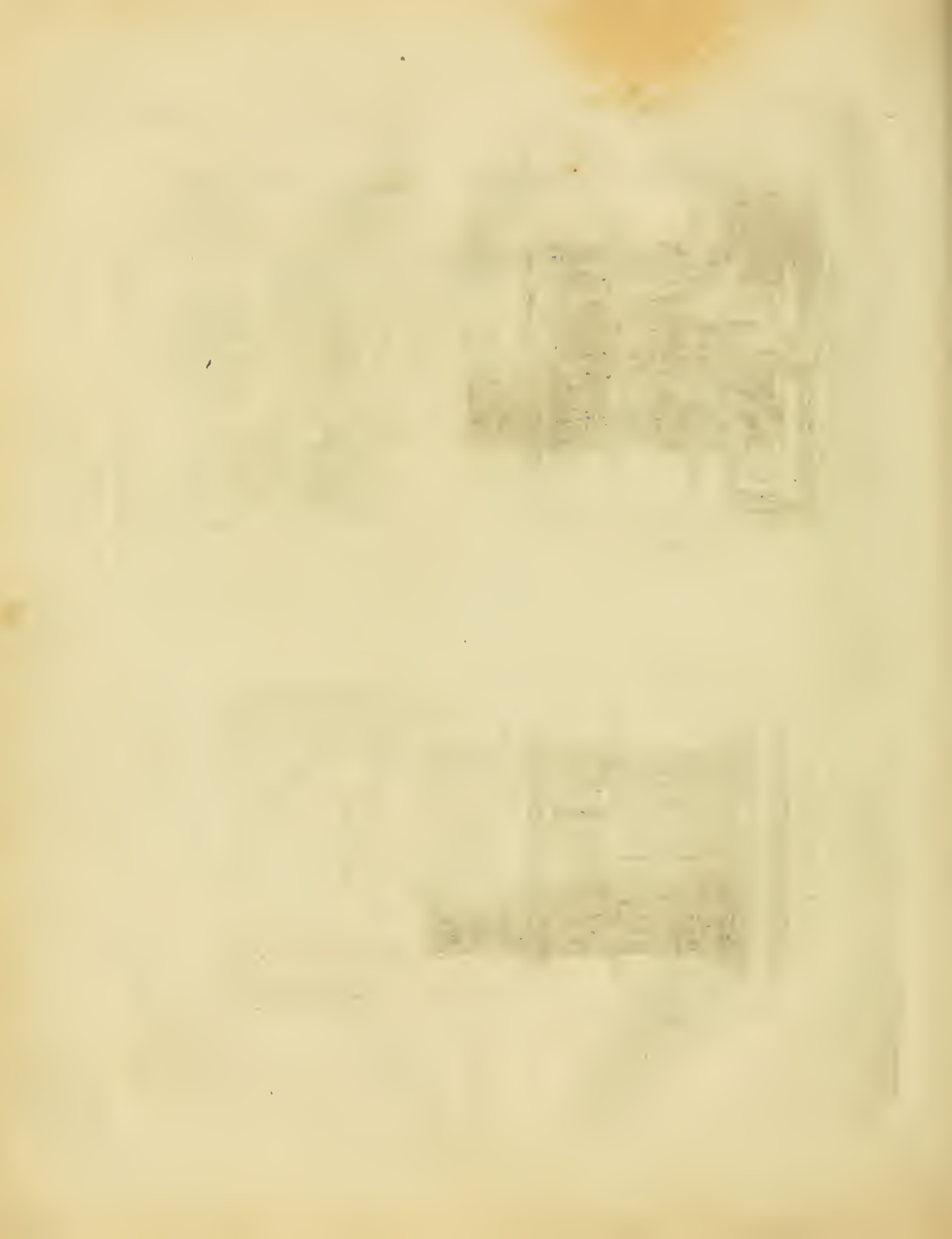


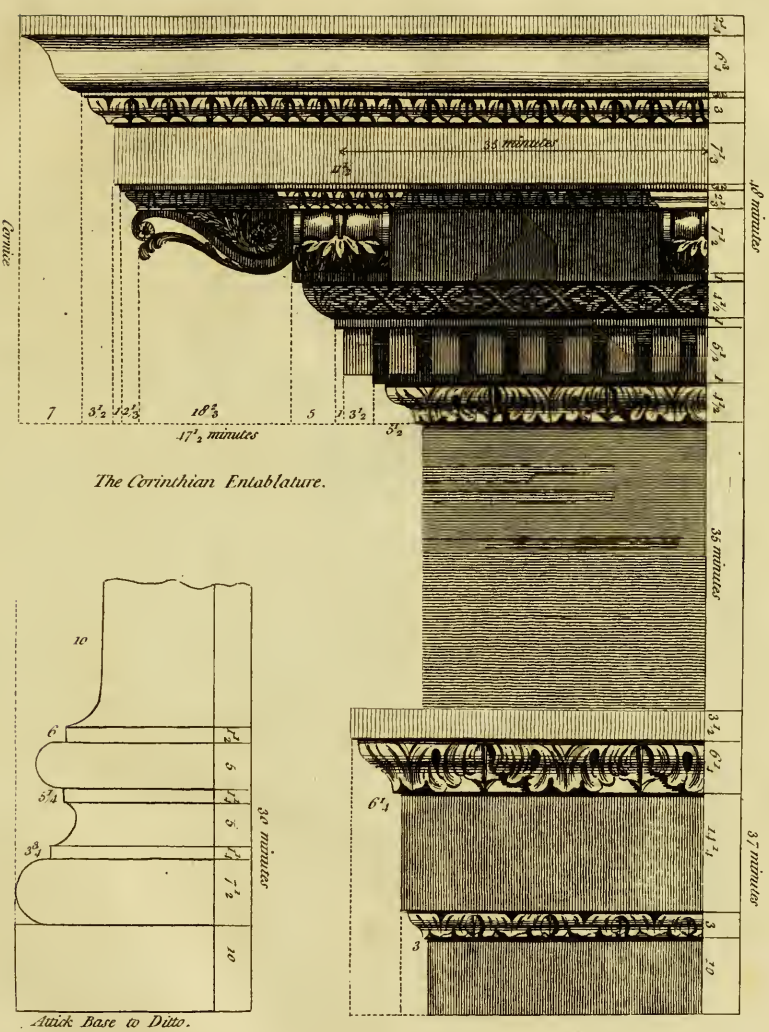
The Antique Ionic Capital in Front
½ Profile
Plan of the Capital
the manner of Coping
the Rocking moldion


Corinthian Base
Ionic Base
The Corinthian Pedestal
1 Diameter 18 minutes
25 parts
Base and Subbase for Rooms
17 parts
5 Inches
3½ Inches into 17 parts
4½ Inches into 25 parts
or 4 in.


Corinthian Capital for a Column.
70 minutes
60 minutes
Semi Plan of a Cap.
minutes 60


A Modern
Composed Capital for a Column.
1 Diameter
60 minutes
Plan of a Cap

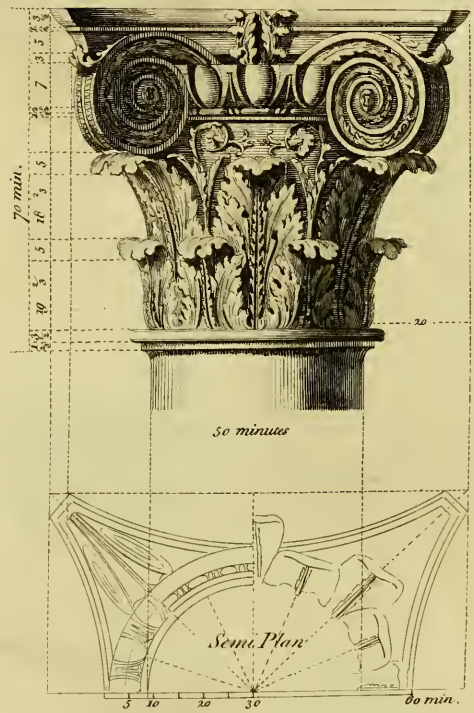




The Corinthian Entablature.

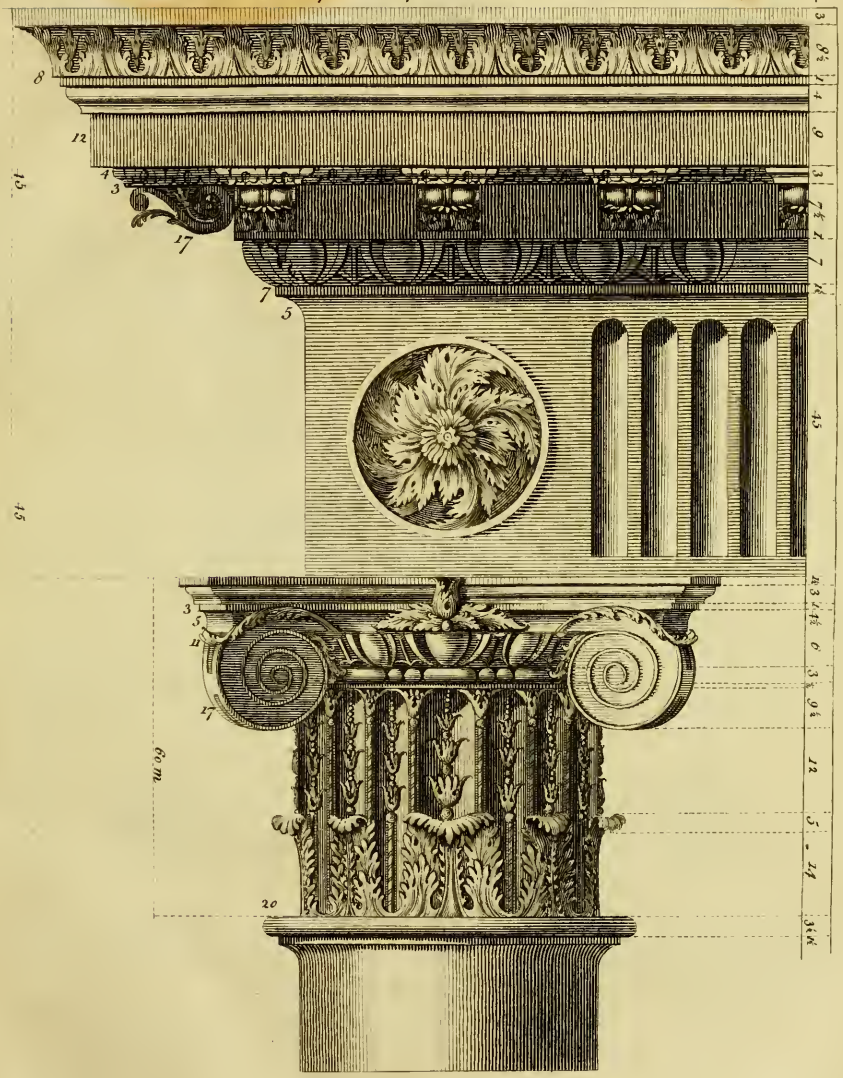
Attick Base to Ditto.

The Antient Composite or Roman Capital



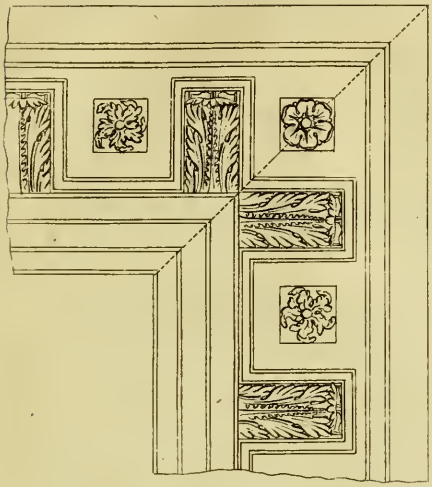
The Proportions of Composite Entablature are the same as the Corinthian.

A Modern Composite Capital and Entablature; Plate XXV.

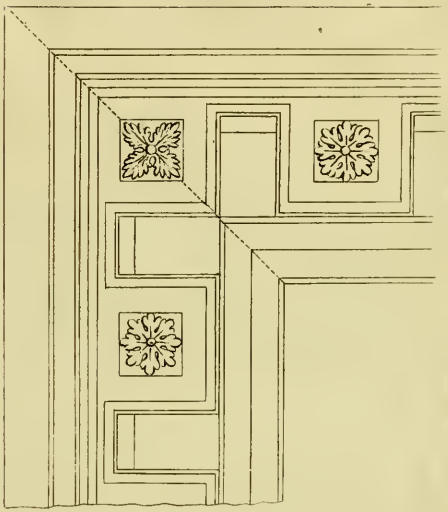


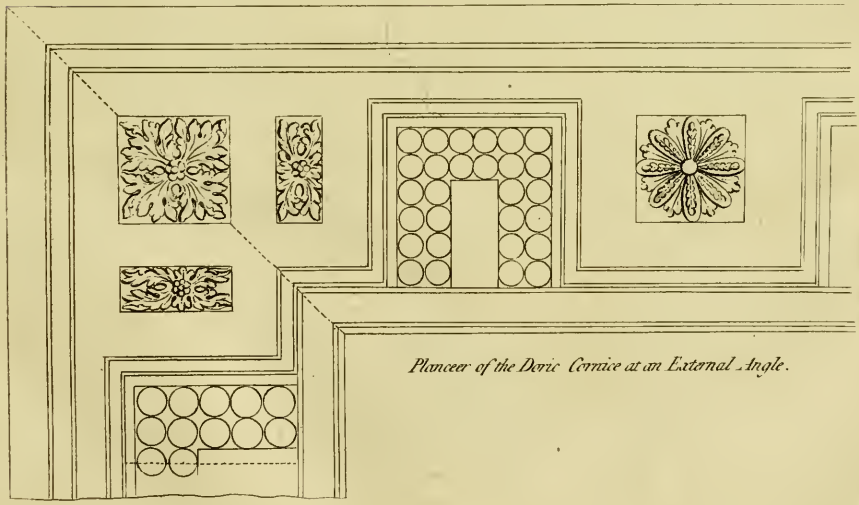
may be used with the Attic Base.

Planceer of the Corinthian Cornice at an External Angle.



Planceer of the Ionic Cornice at an External Angle.

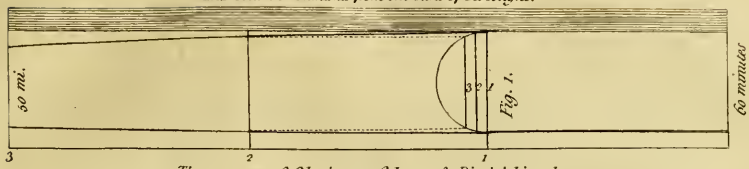




Planceer of the Doric Cornice at an External Angle.

Glueing of Columns.

This Column Diminishes from one third of the Height.

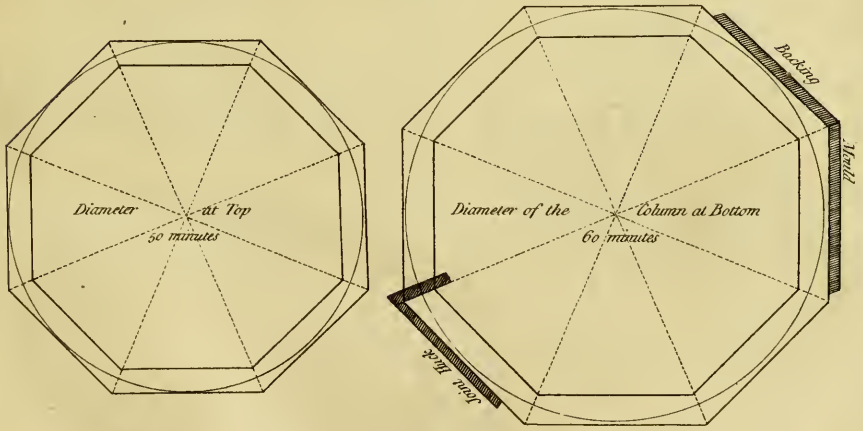


The manner of Glueing up Columns & Diminishing them

This Column Diminishes from the Bottom to the Top

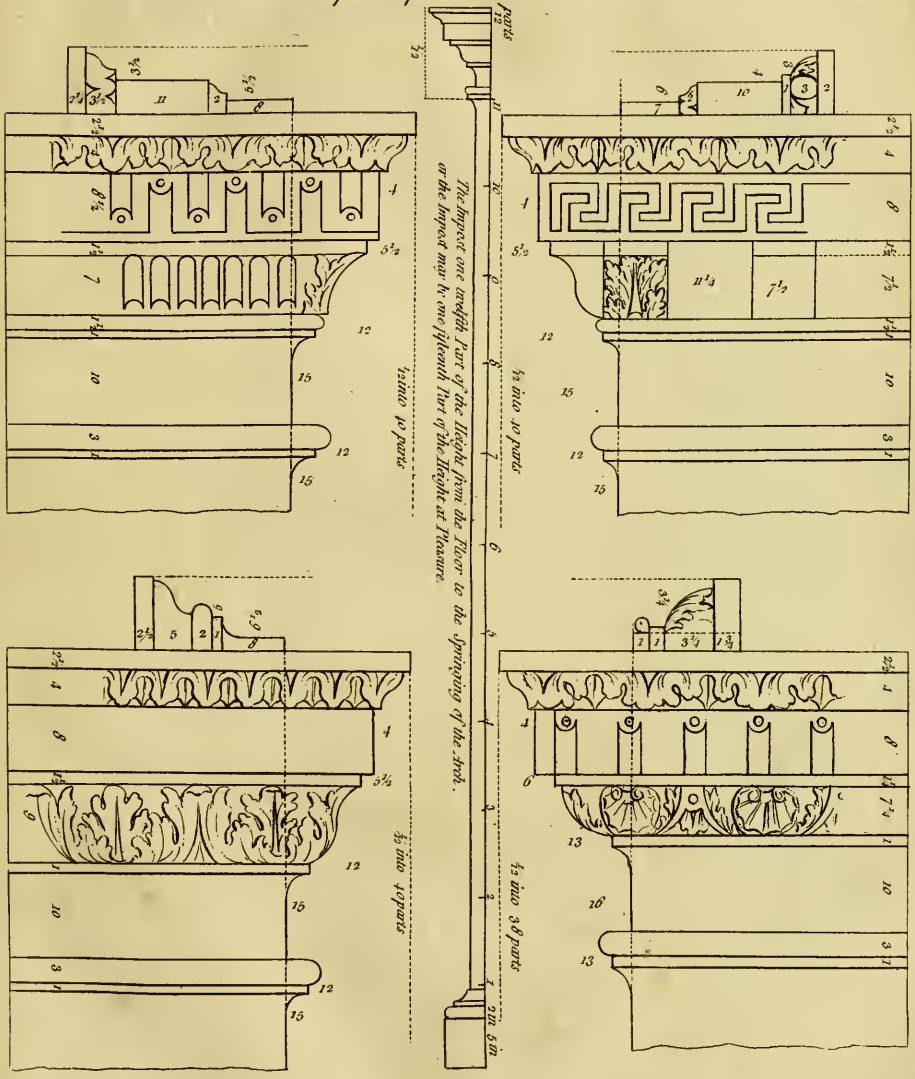
When Columns are fluted divide the Round or Circumference into 96 parts give three to a Flute and one to a Fillet.

Diminish the Staves of the Columns on the Faces before they are Glued together, this is a very safe and sure way for making the Column.

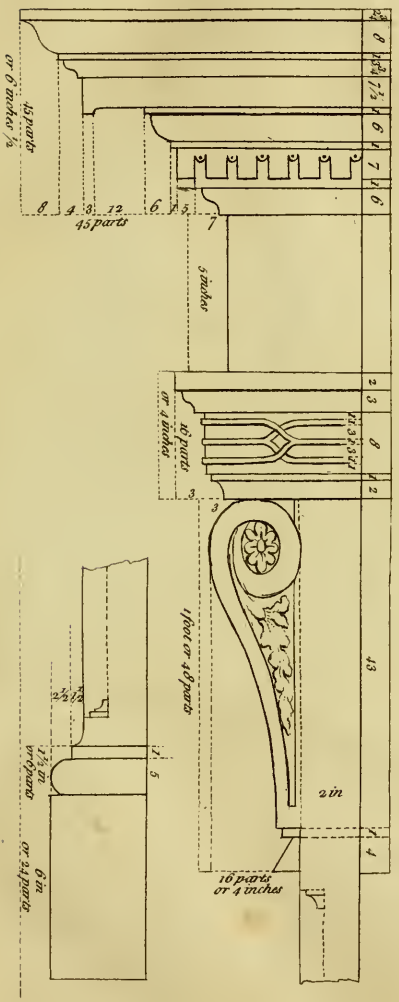


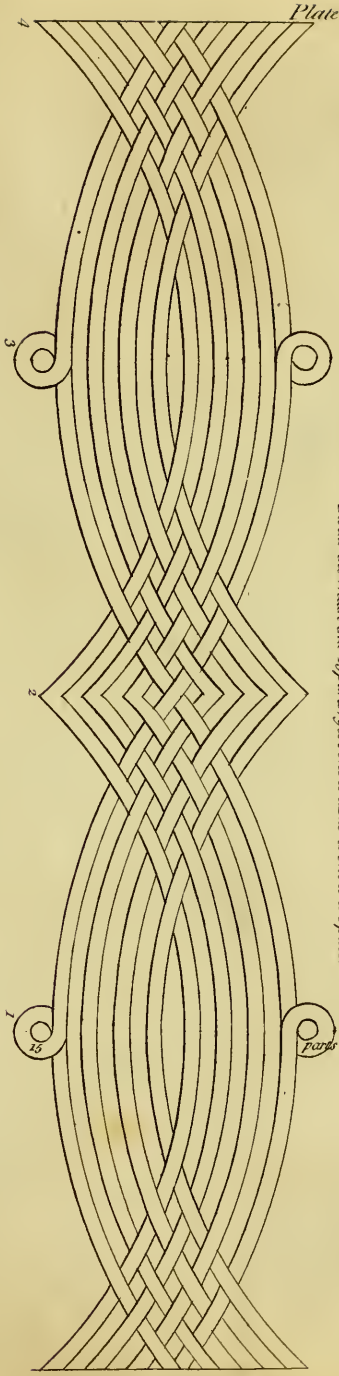
When Pilasters are Fluted divide the Breadth or Diameter into 29 parts give one to a Fillet and three to a Flute.

Imposts for Arches &c.


The Impost one twelfth part of the Height from the Floor to the Springing of the Arch.
or the Impost may be one fifteenth Part of the Height at Pleasure.
parts
12 into 10 parts
12 into 10 parts
12 into 10 parts
12 into 10 parts
1m 5m

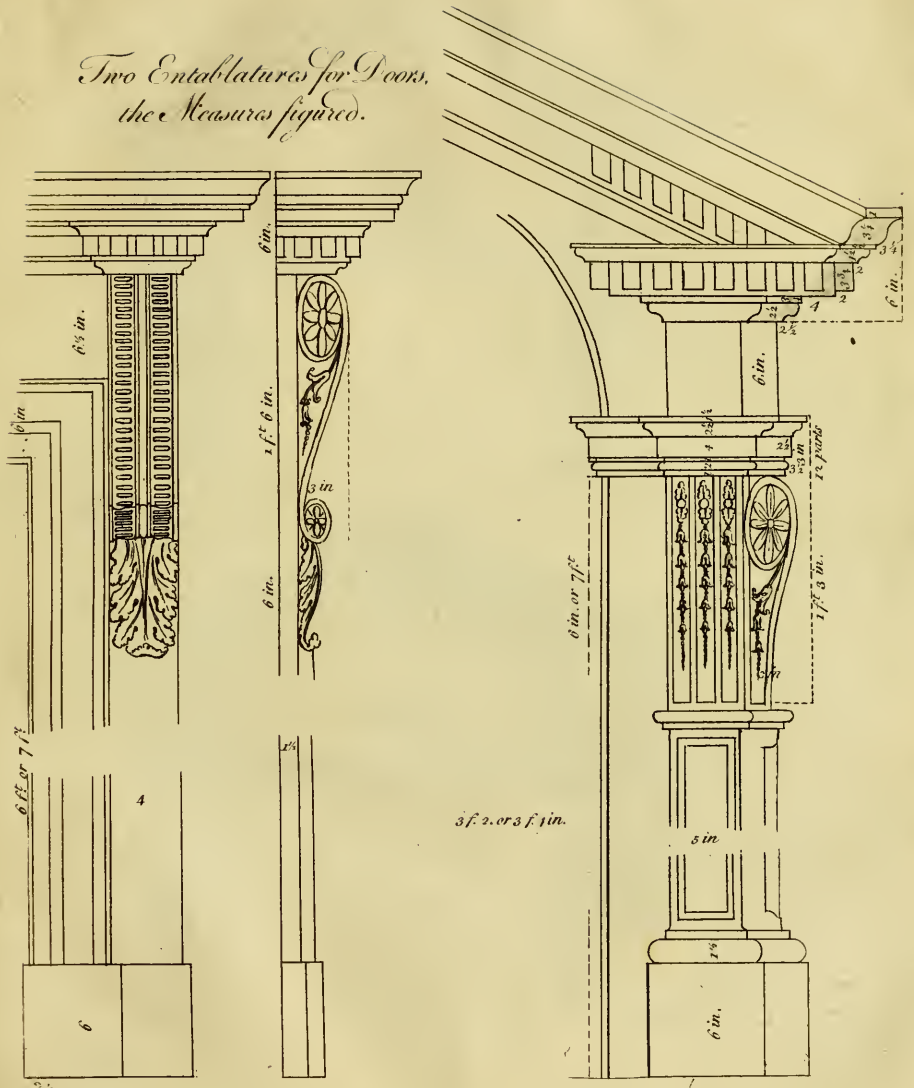
Entablature for Doors Windows &c.
with all the Measures figured for Practice at large.

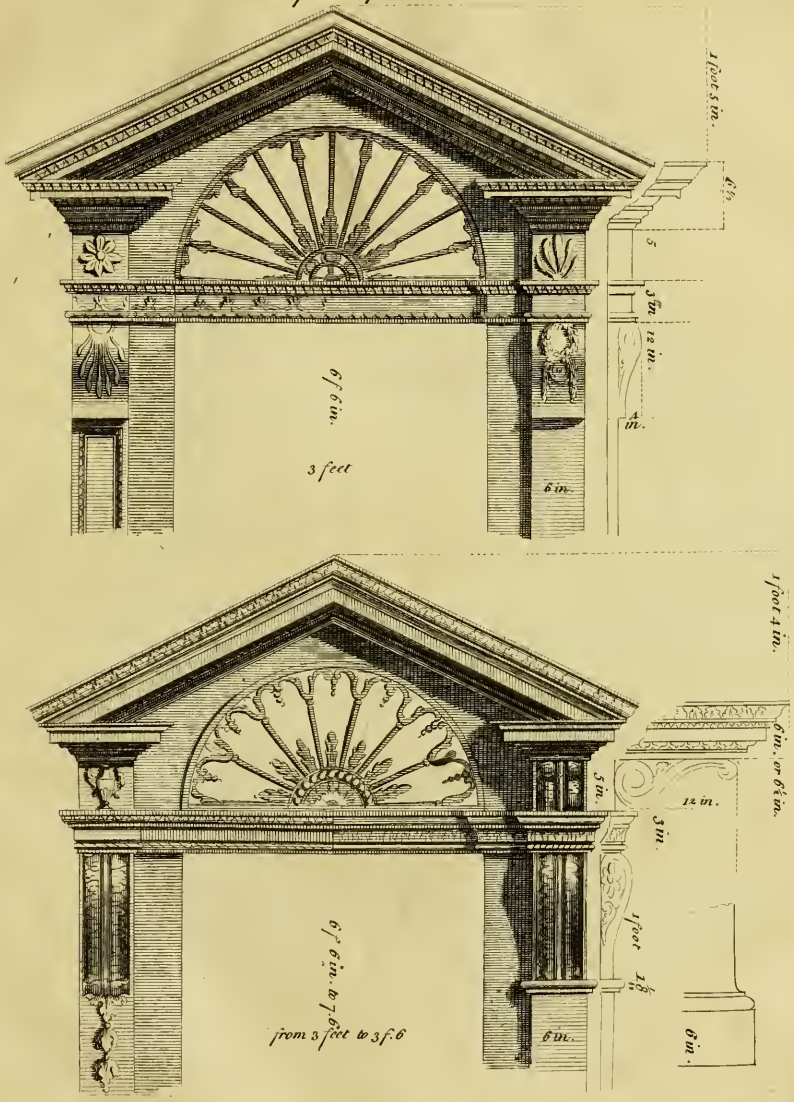




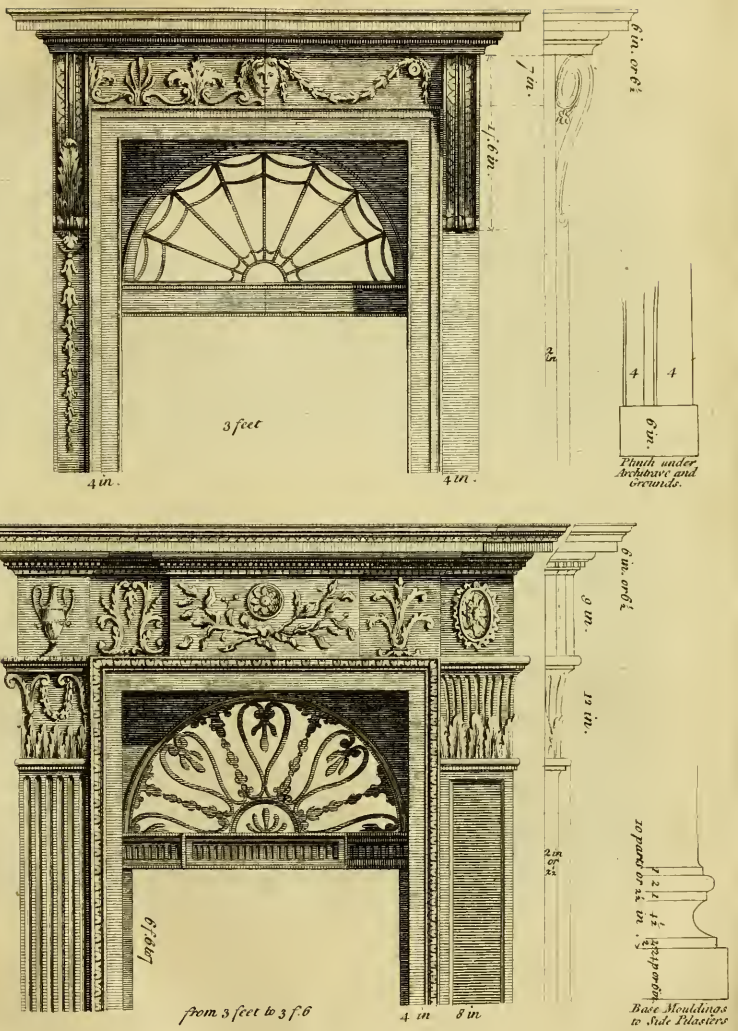
A Guide how for the Radiating Pioneer of a Pedement &c.
Divide the Width into 15 parts, give one to a Rib & one to a Space.

Two Entablatures for Doors, the Measures figured.




1 foot 5 in.
6 in.
5
3 in.
12 in.
4 in.
6 f 6 in.
3 feet
6 in.
1 foot 4 in.
6 in. or 6½ in.
5 in.
12 in.
3 in.
1 foot 1⅛ in.
6 f 6 in. to 7 f 6
from 3 feet to 3 f 6
6 in.
6 in.

Designs for Door Cases.



Door Cases for Rooms.

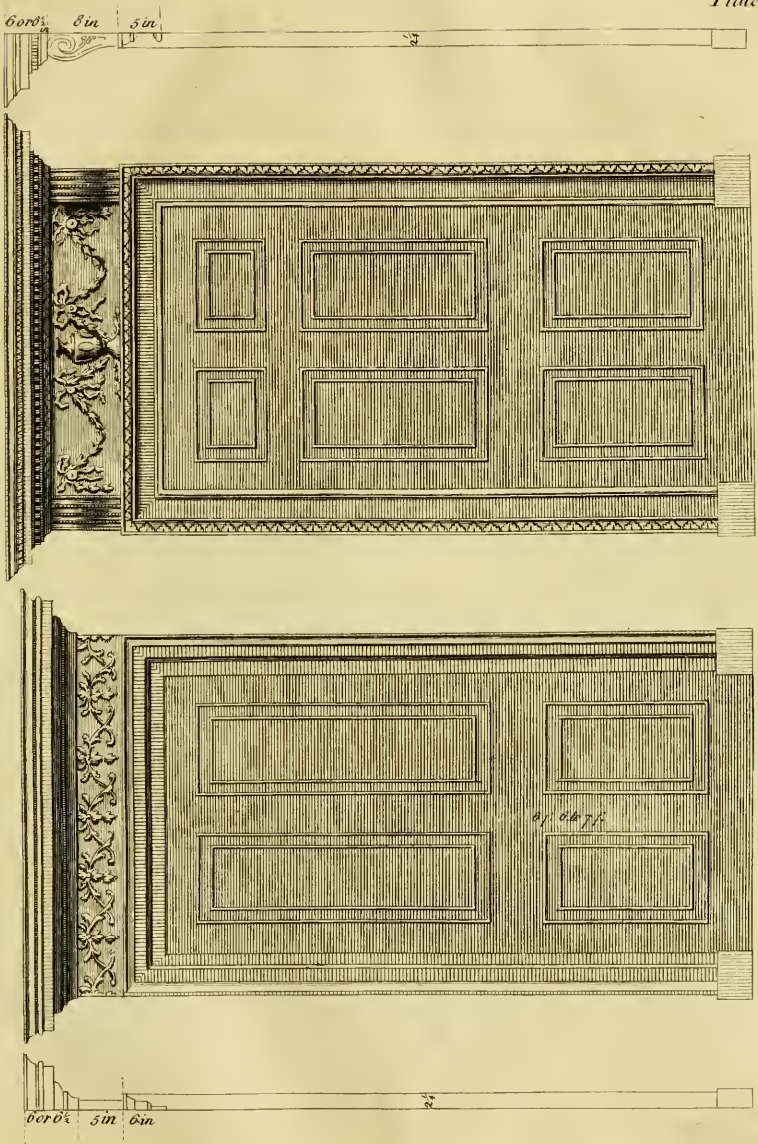
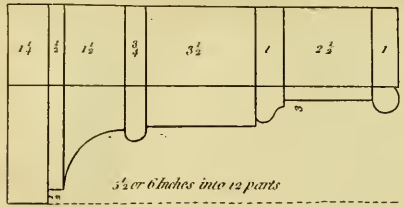
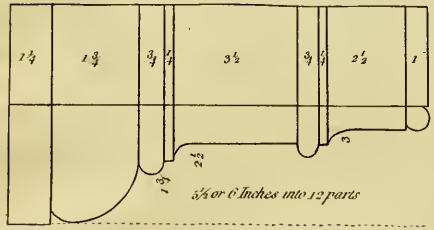
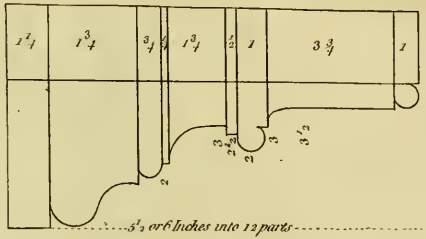


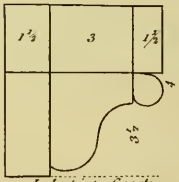
Plate XXXV.

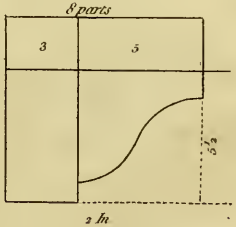


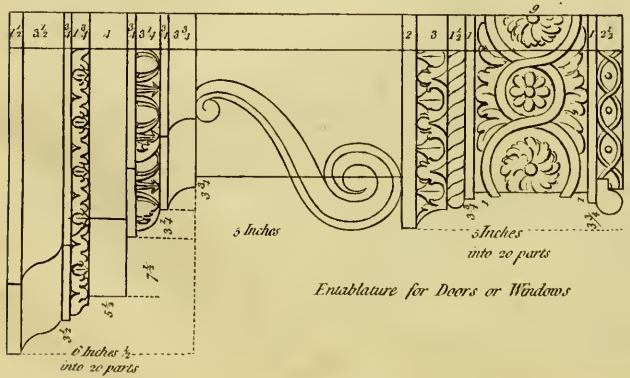


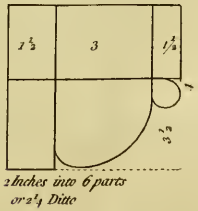
Architrave Mouldings for Doors, Windows &c.

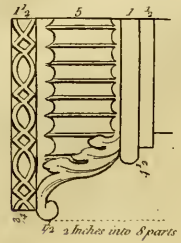


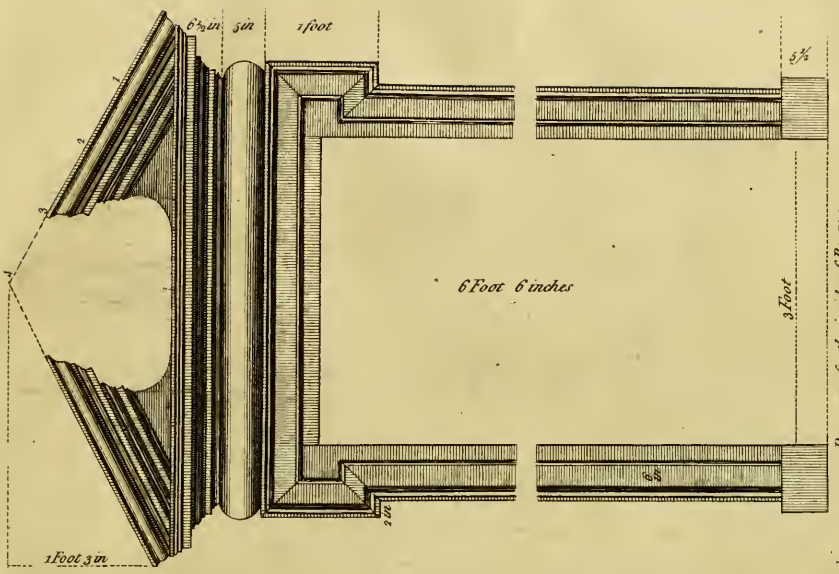


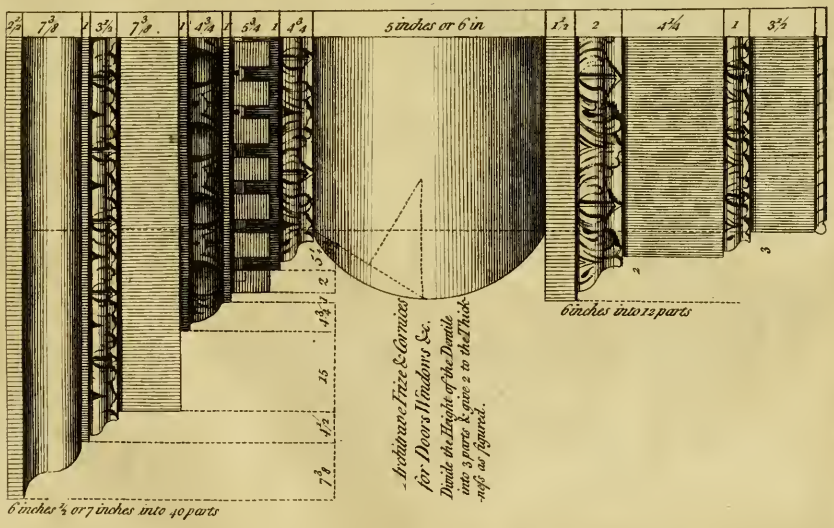









6 in
5 in
1 foot
5½
6 Foot 6 inches
3 Foot
Door-way for the inside of Rooms.
1 Foot 3 in.


5 inches or 6 in
6 inches into 12 parts
6 inches ⅔ or 7 inches into 40 parts
Architrave Frize & Cornice for Doors Windows &c.
Divide the Height of the Dentile into 3 parts K, give 2 to the Thickness as figured.

Half of a Compound open Pediment.

The whole Length of the Pediment on the Back, is Divided into four parts, and the Cornice Returns at three of those parts.

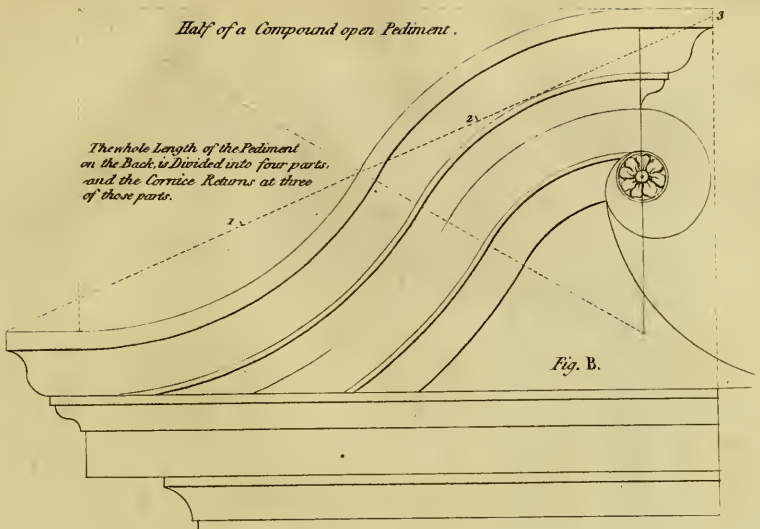


Fig. B.

Open Pediments.

The Construction of Raking and Returnd Mouldings in Pediments the upper Part Fig. A. *returns Perpendicular and the lower Part returns Square to the Back of the Pediment. the Centers are at Right Angles with the Projection & all Projecting alike, a b, b a & b a.*

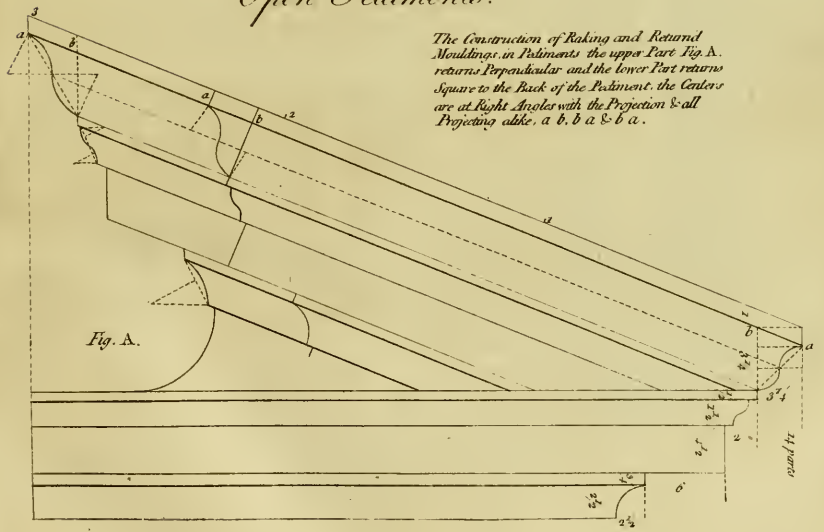
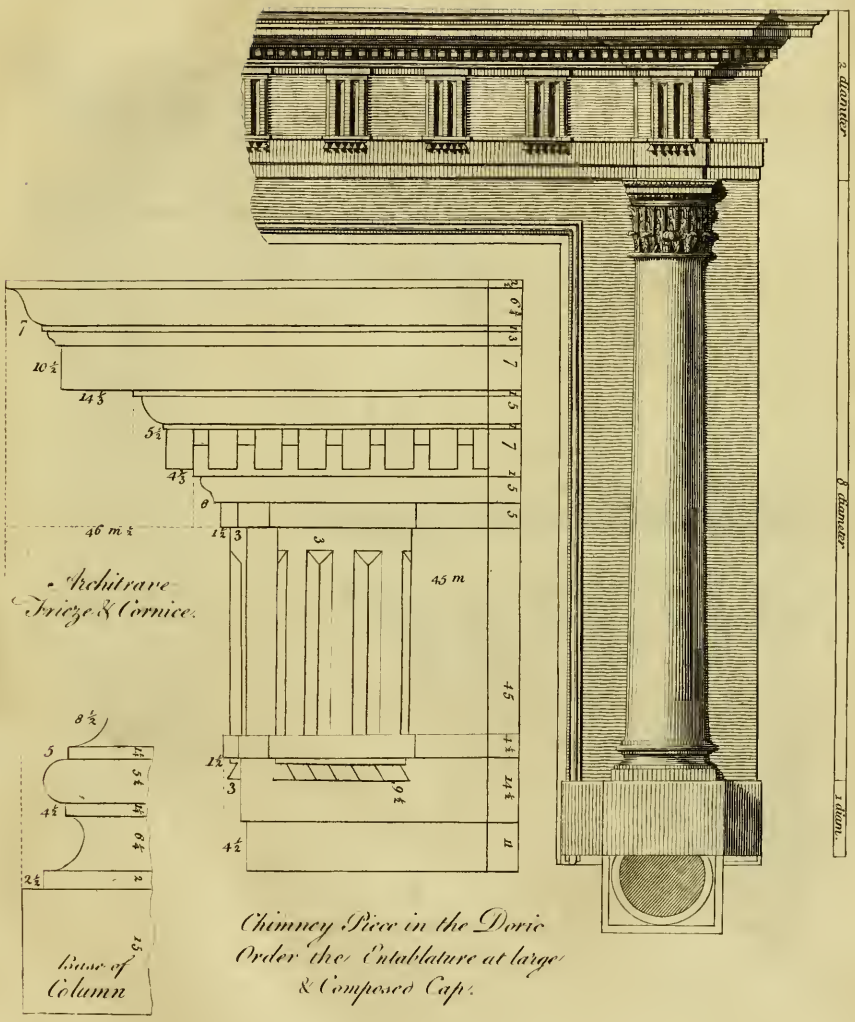
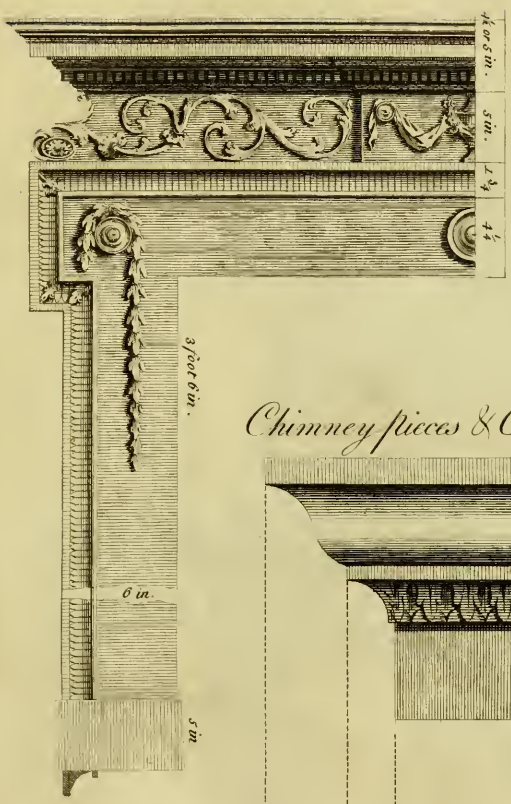


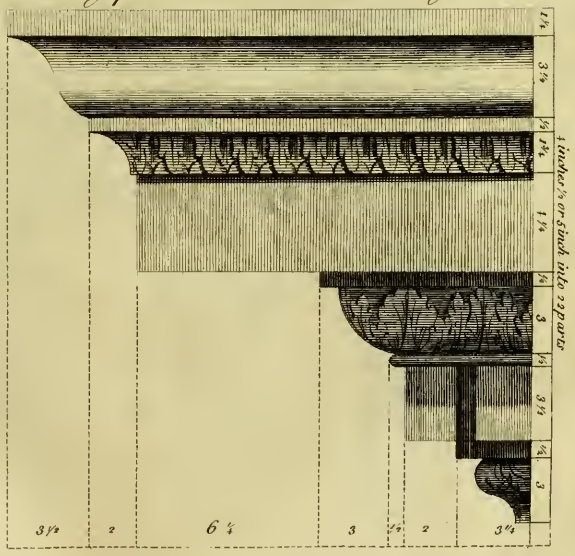
Fig. A.



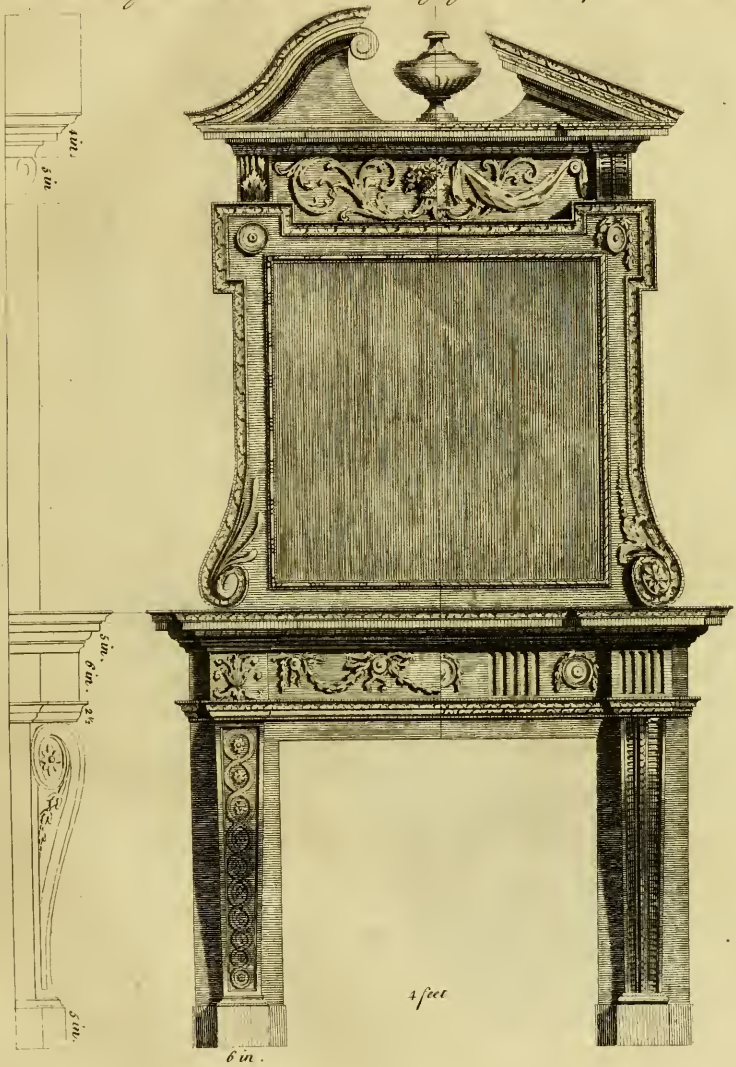
Chimney Piece in the Doric Order the Entablature at large & Composed Capt.



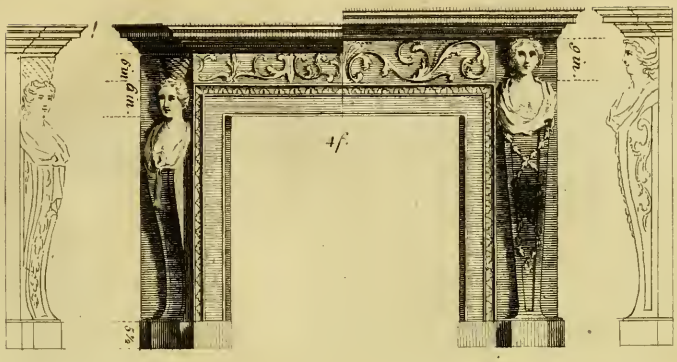
Chimney pieces & Cornice at Large

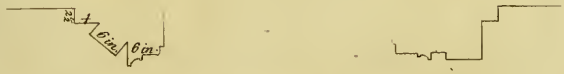


Two Chimney Pieces with open Pediment, Glass or Picture-frames ornamented.

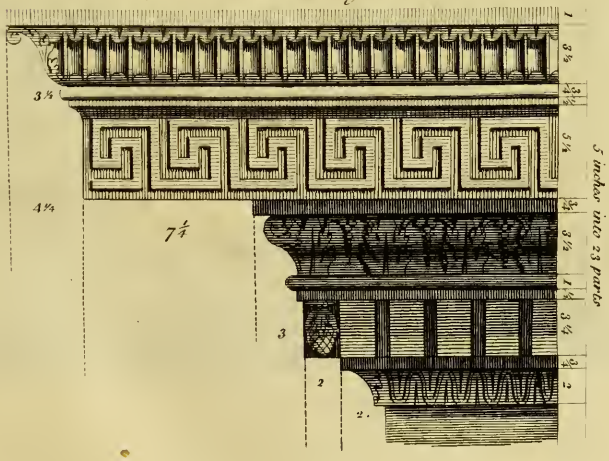


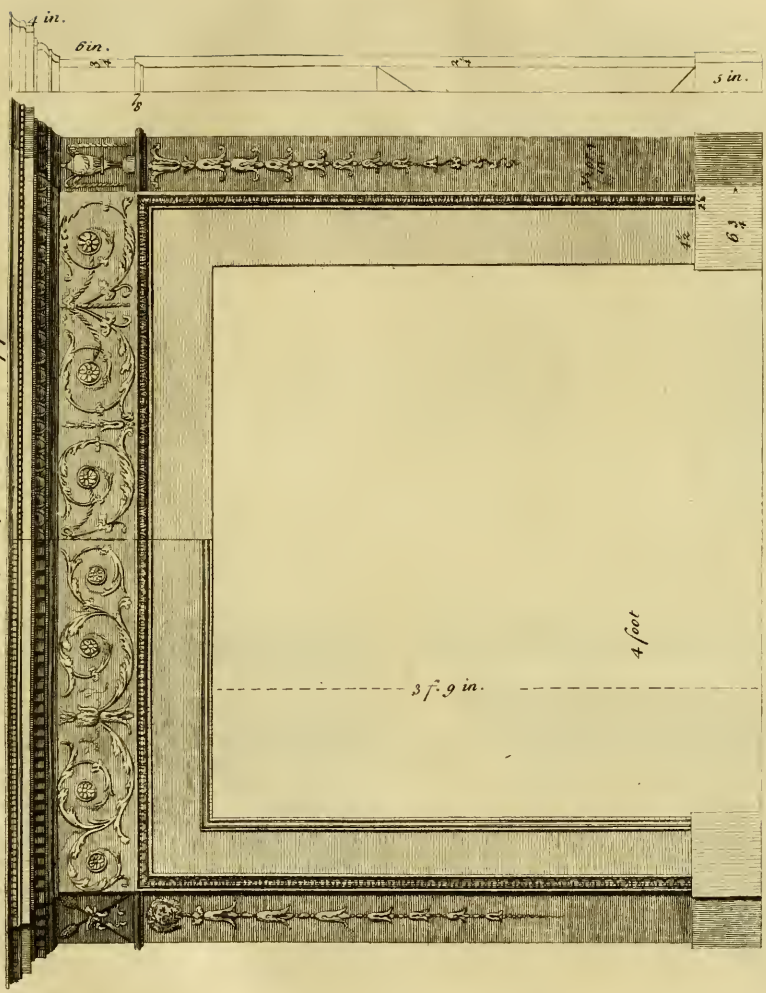
Two Designs for Chimneys with Caryattic Figures.



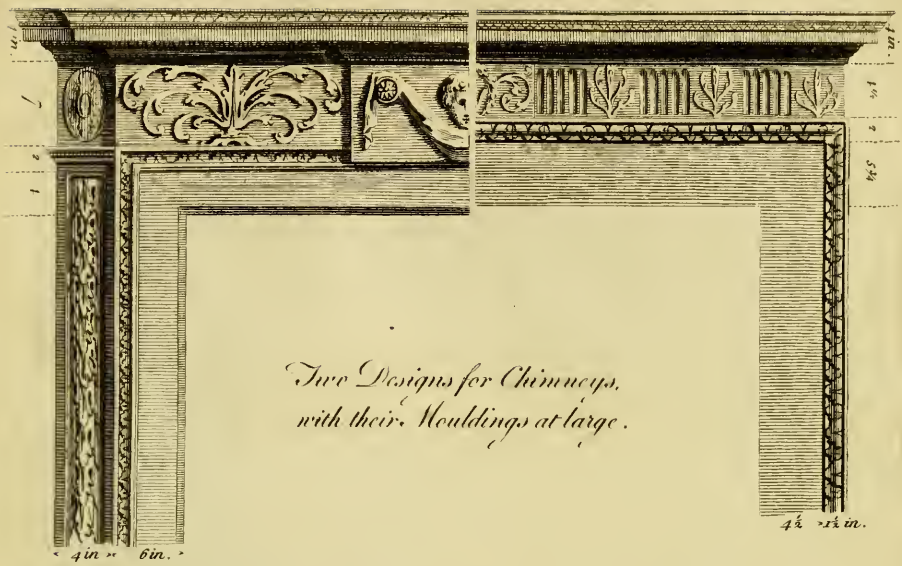


Cornice at large.

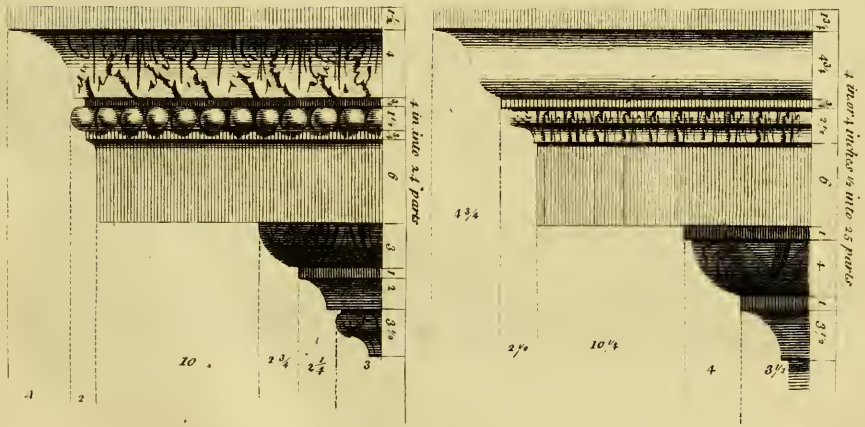


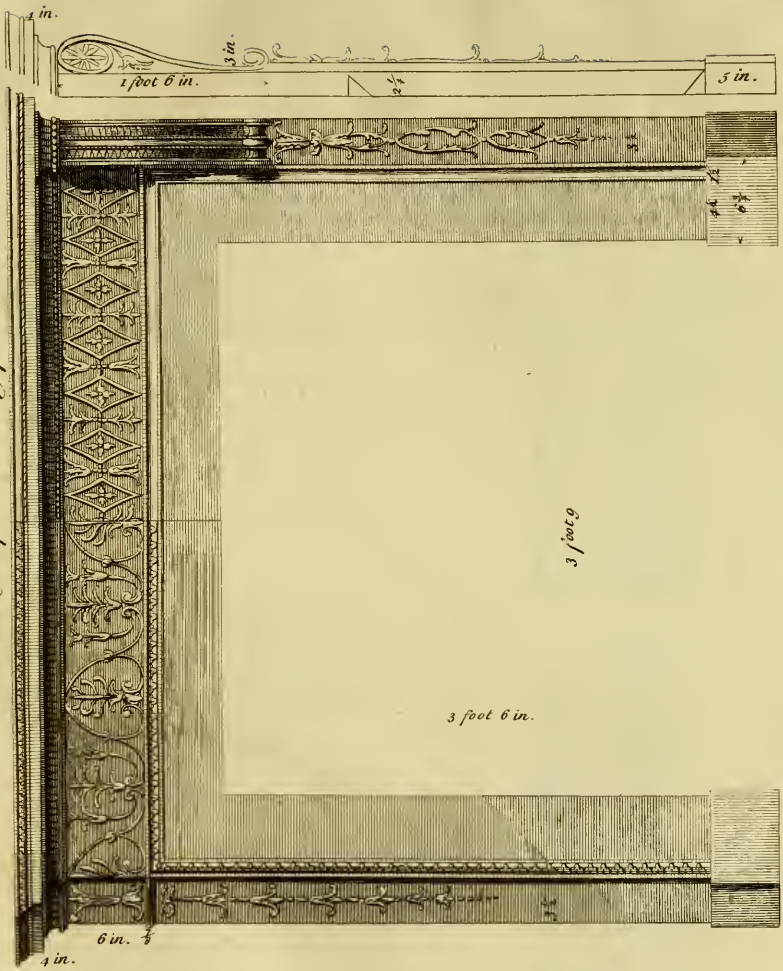


Two Designs for Chimney pieces.

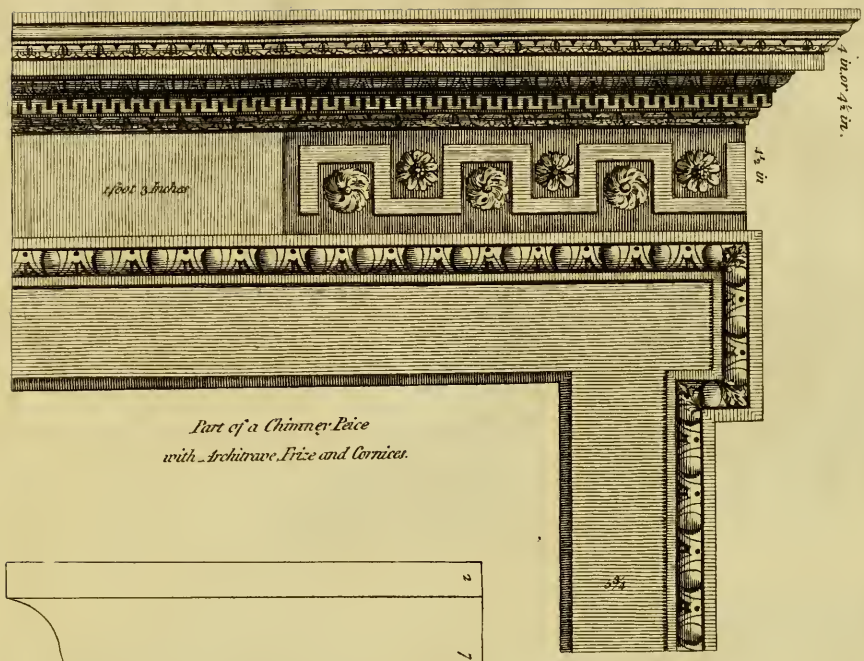


Two Designs for Chimneys,
with their Mouldings at large.

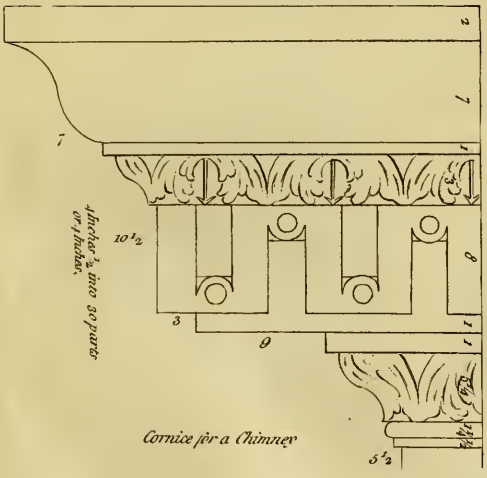




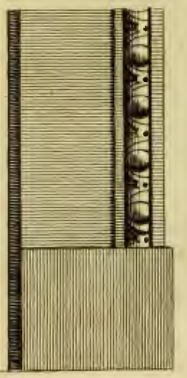
Two Designs for Chimney-Pieces.



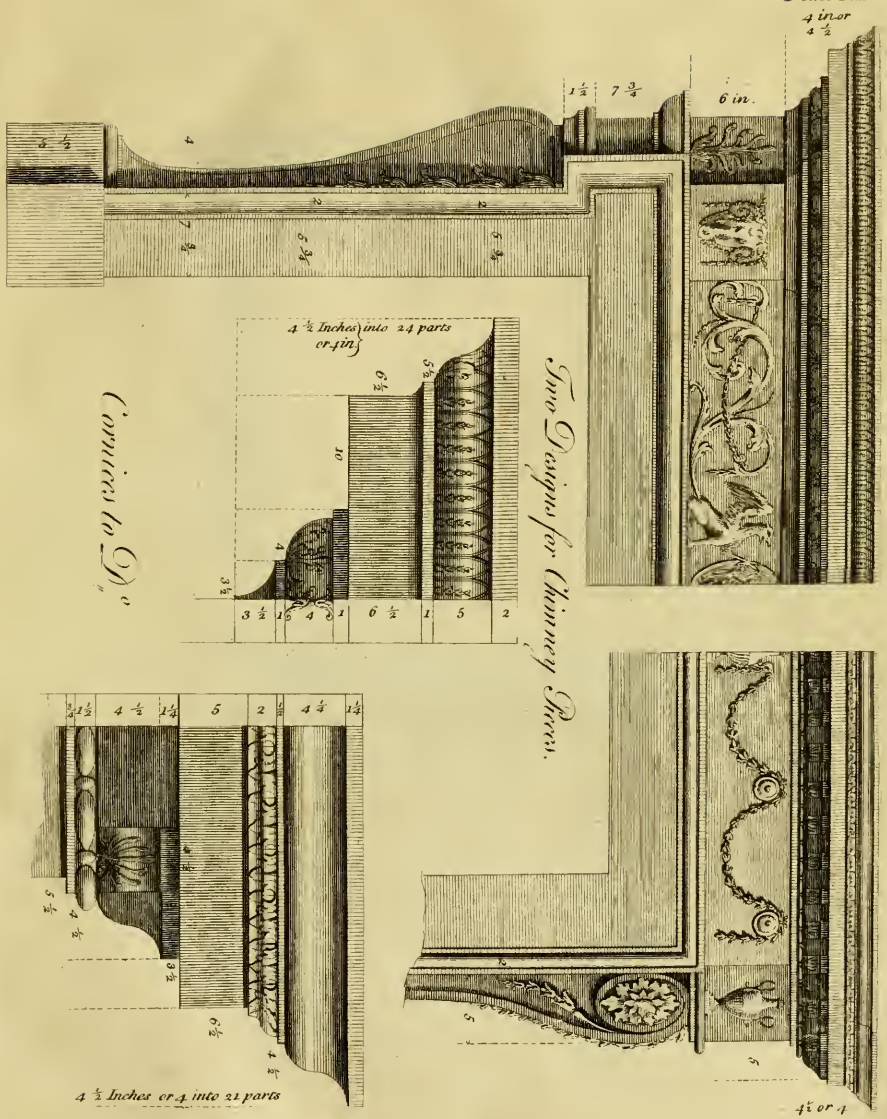
Part of a Chimney Peice
with Architrave Prize and Cornices.



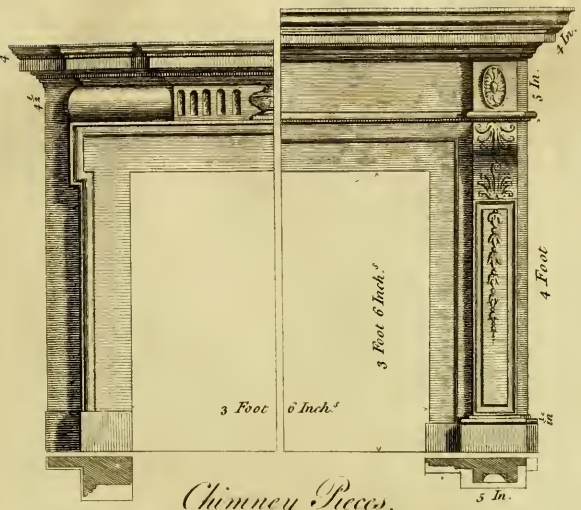
Cornice for a Chimney



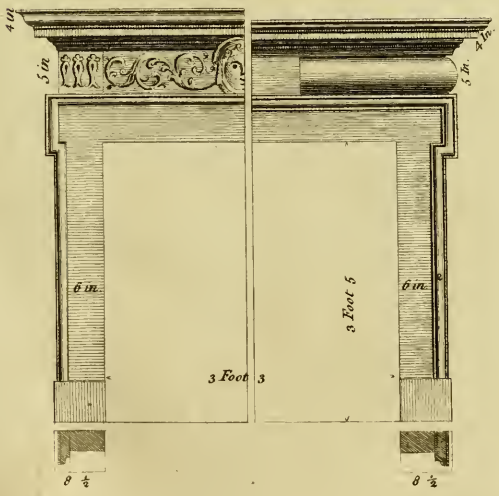
Two Designs for Chimney Pieces.

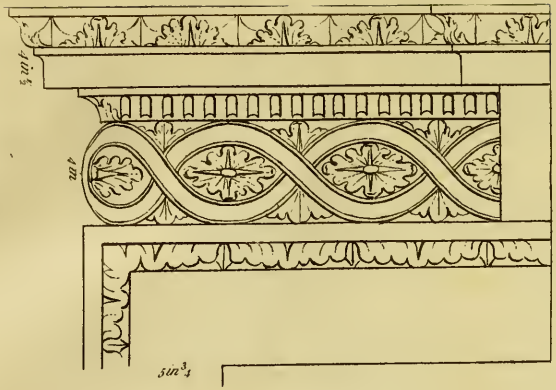


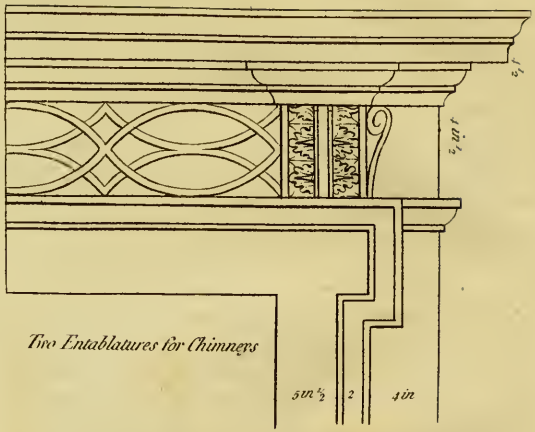
Cornices to Do.



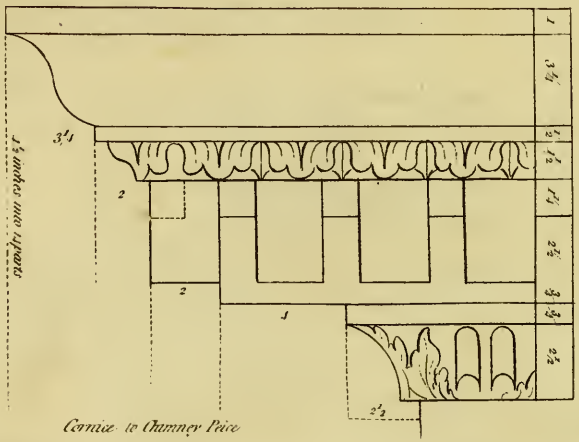
Chimney Pieces.



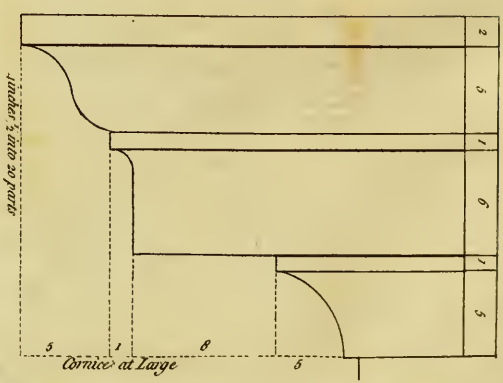




Two Entablatures for Chimneys

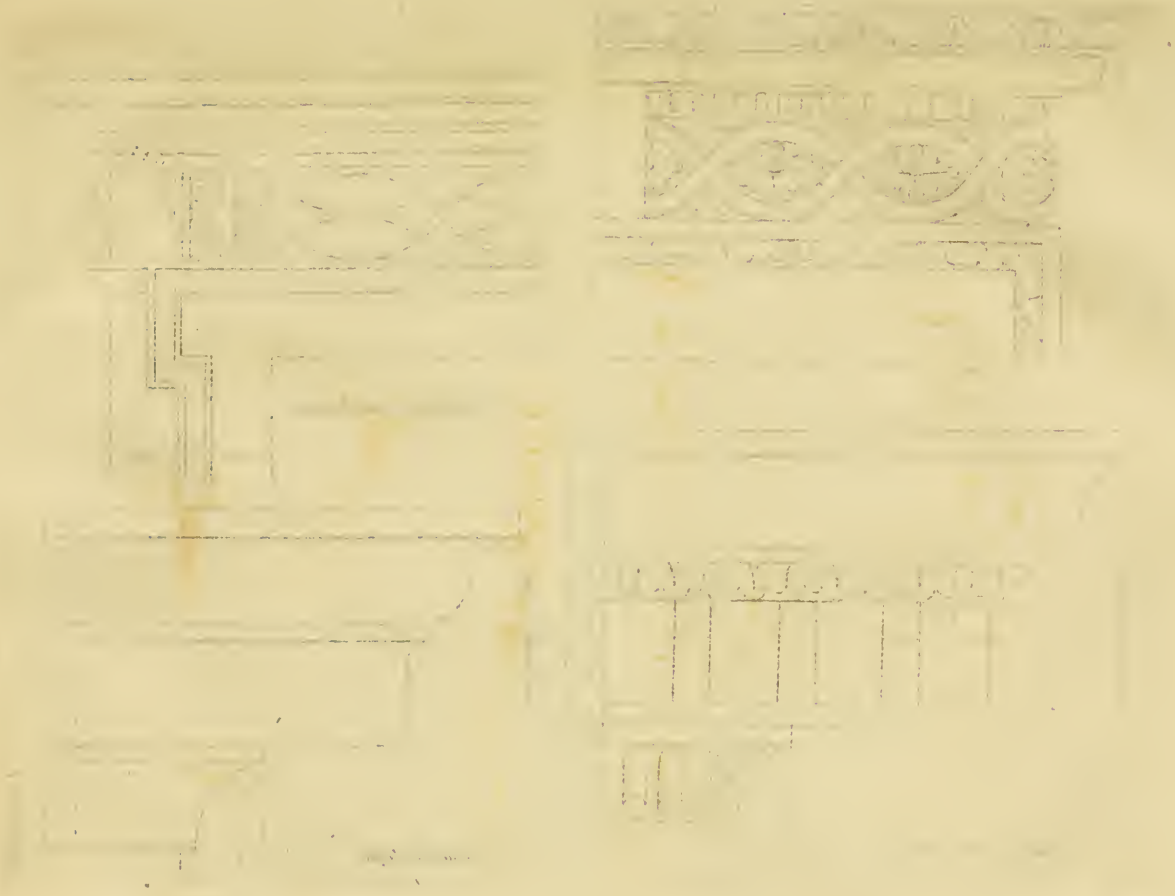


Cornice to Chimney Piece

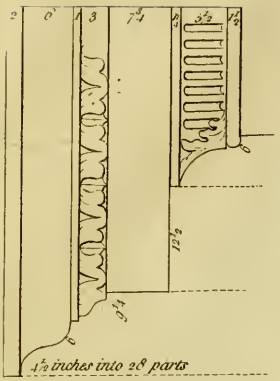


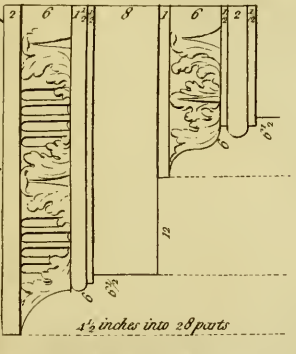
Cornice at Large

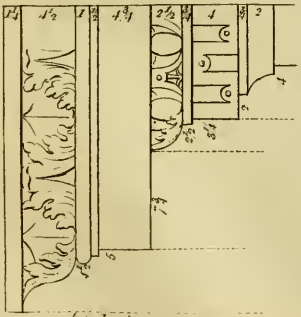
Plate XLVII.

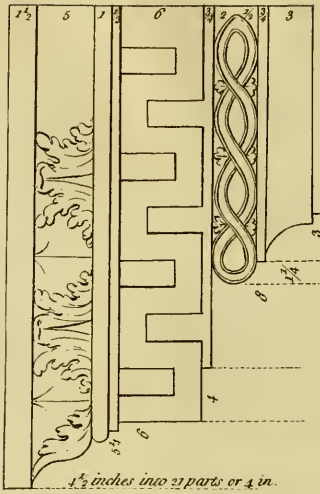


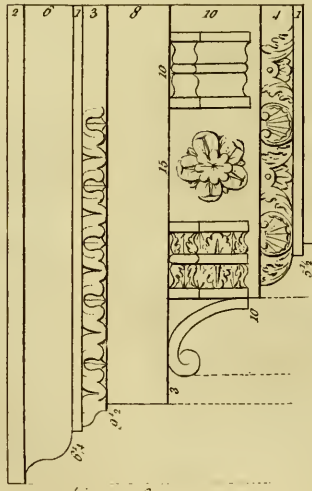
Cornices & Architraves for Chimneys &c.

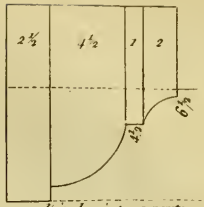


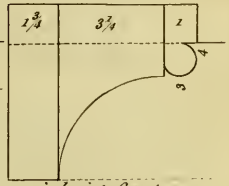


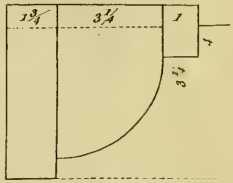


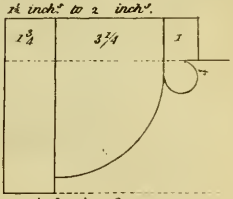


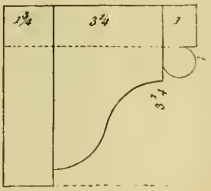




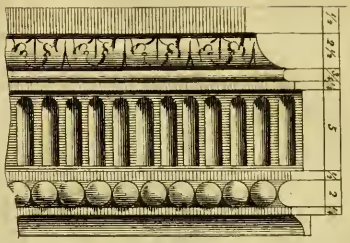


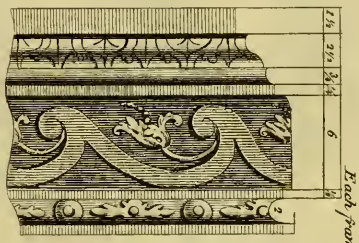


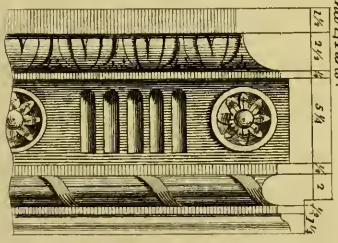


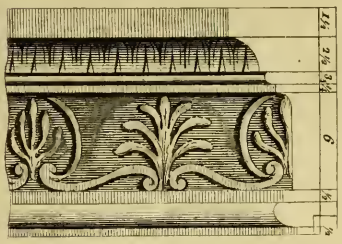


Mouldings for Looking Glaſs or Picture Frames.

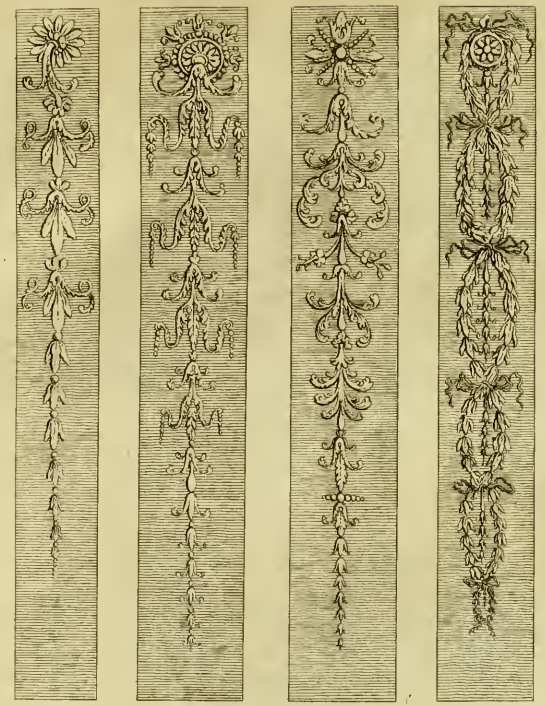


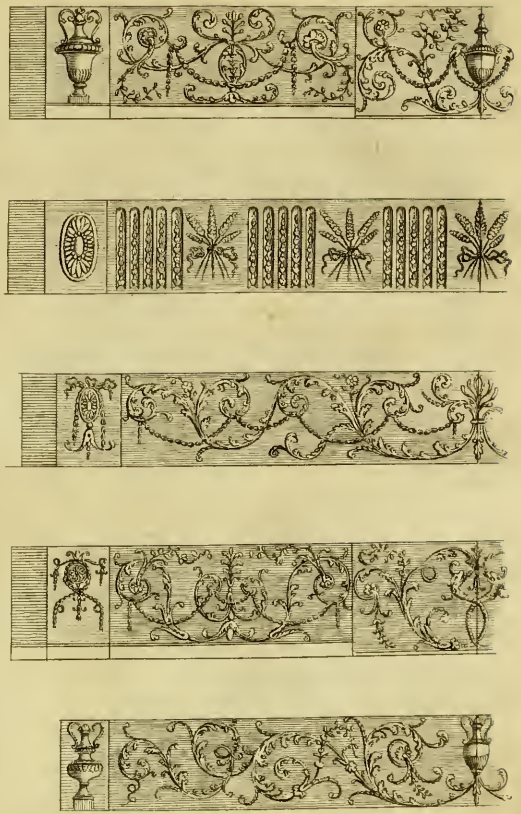






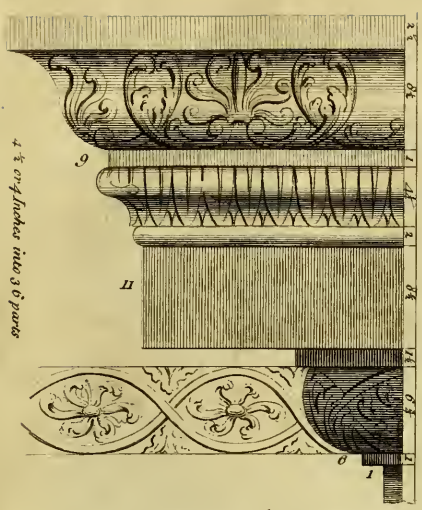
Each frame into 11 Parts.

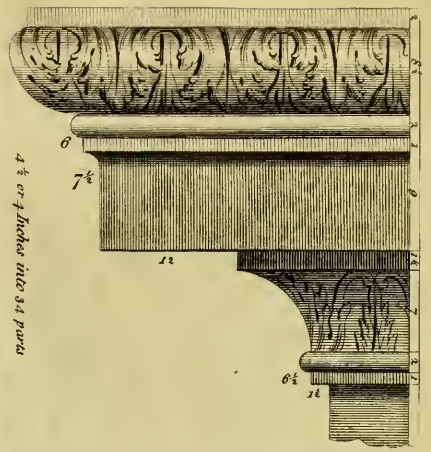




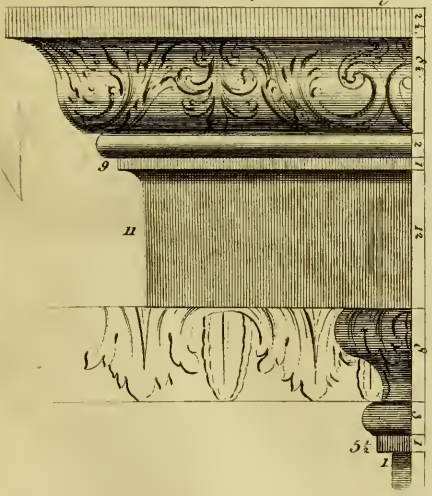
Ornaments for Friezes & Pilasters &c.

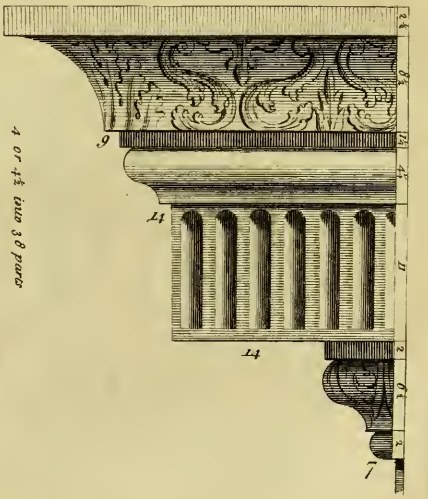
Plate L.





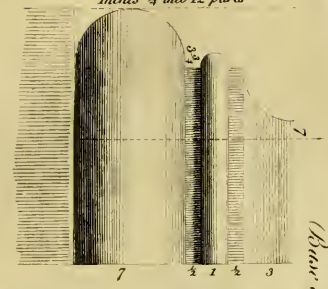
Cornices for Chimney Caps Doors or Windows &c.



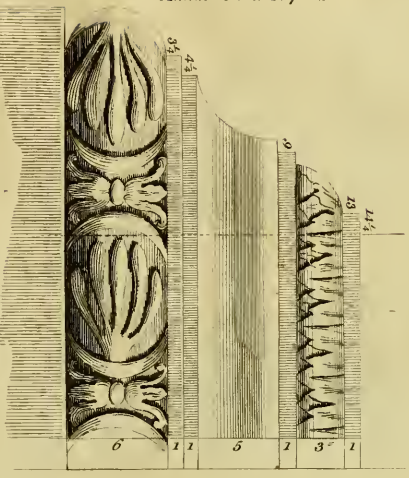


Base Mouldings for the Pedestal part of Rooms.

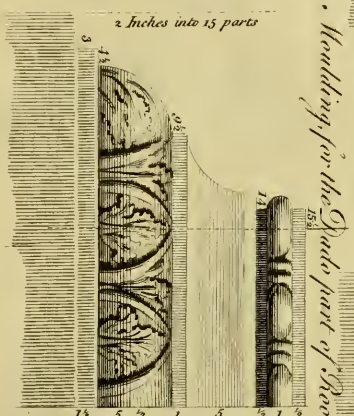
Inches ⅔ into 12 parts



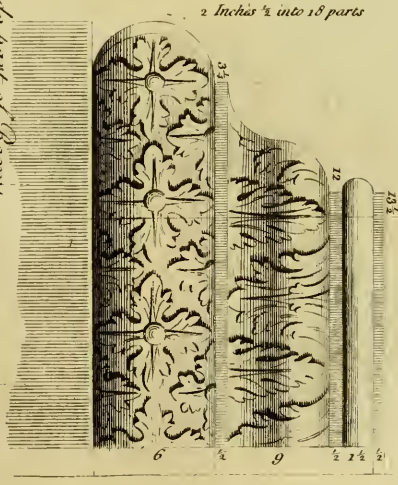
2 Inches ½ into 18 parts



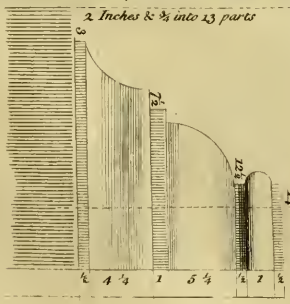
2 Inches into 15 parts



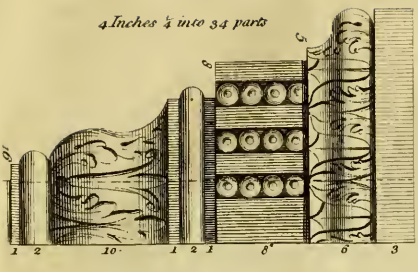
2 Inches ½ into 18 parts



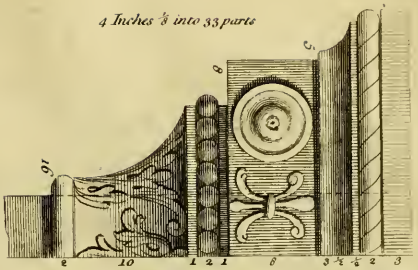
2 Inches & ⅔ into 13 parts



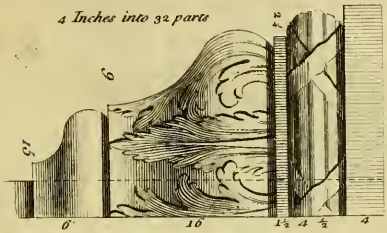
4 Inches ¼ into 34 parts



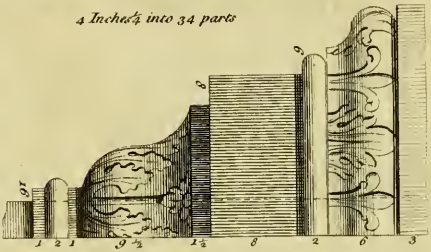
4 Inches ⅛ into 33 parts



4 Inches into 32 parts

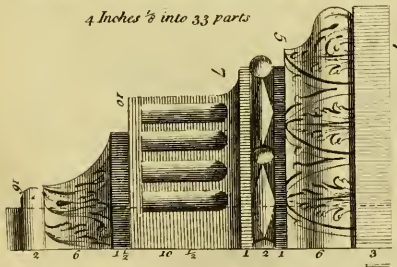


4 Inches ¼ into 34 parts

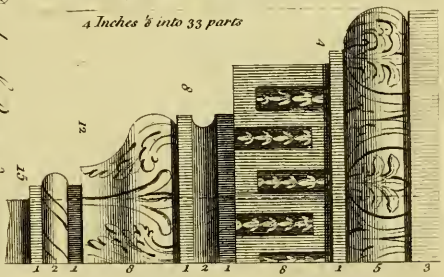


Subbases for the Dado of Rooms &c.

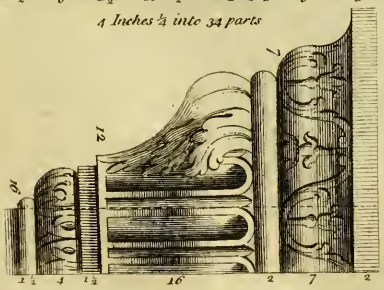
4 Inches ⅛ into 33 parts



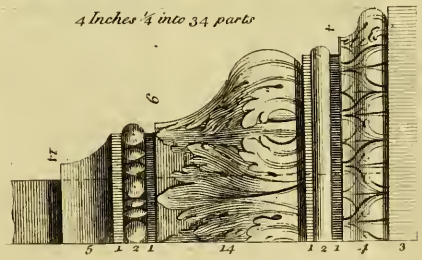
4 Inches ⅛ into 33 parts



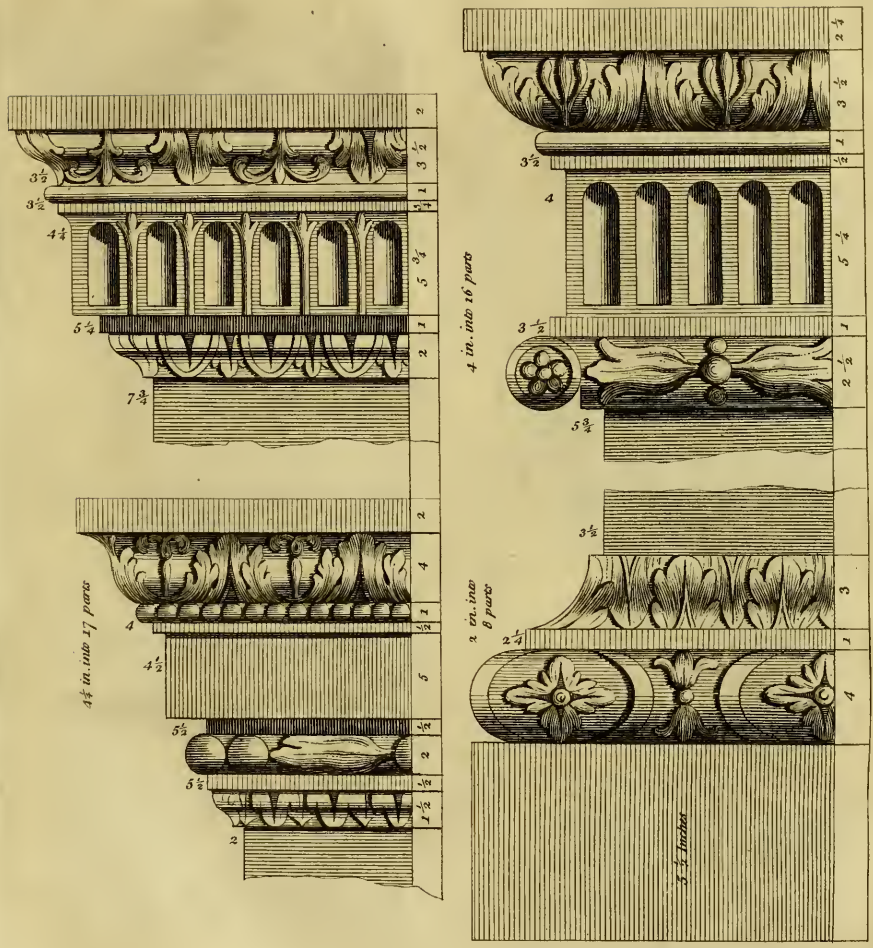
4 Inches ¼ into 34 parts

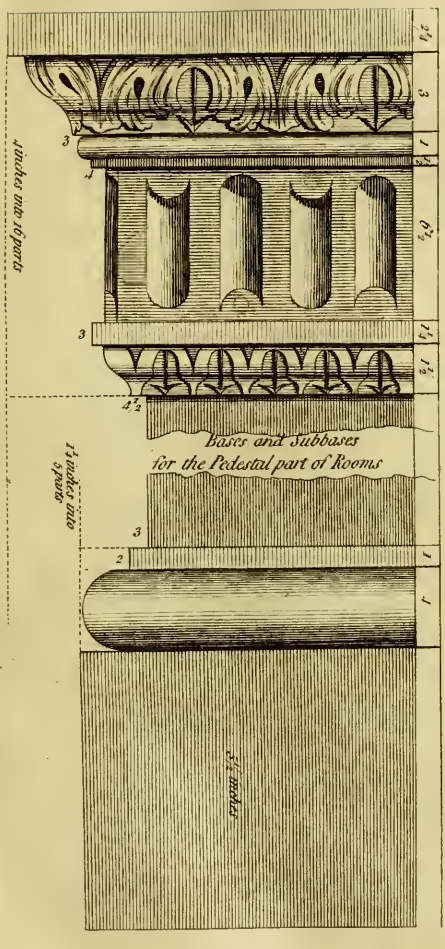


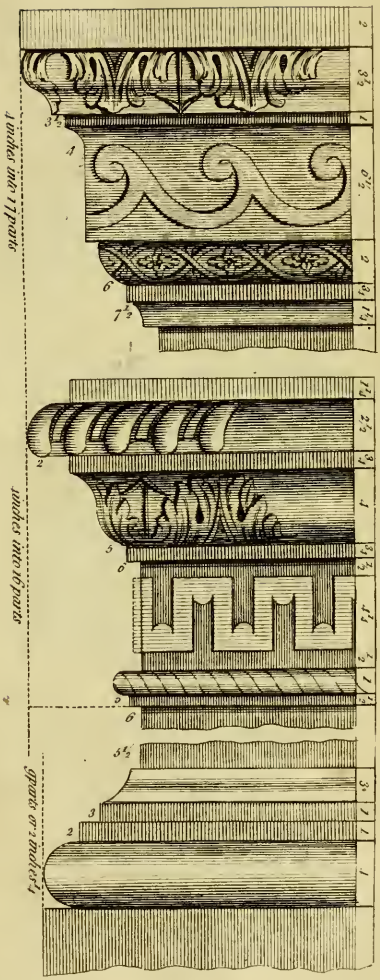
4 Inches ¼ into 34 parts



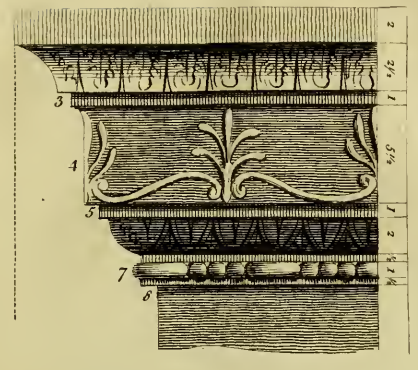
Base & Sub-base for Rooms.

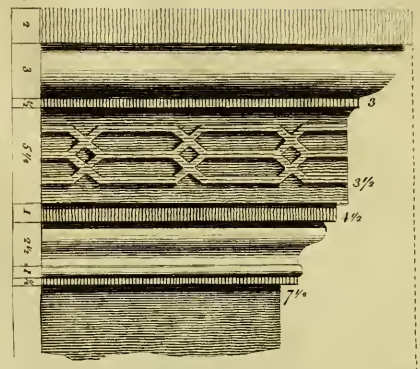


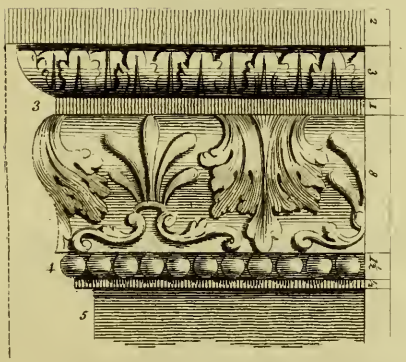

inches one 16 parts
Bases and Subbases
for the Pedestal part of Rooms
14 inches into 15 parts


1 inches into 11 parts
inches into 15 parts
15 parts or 1 inches

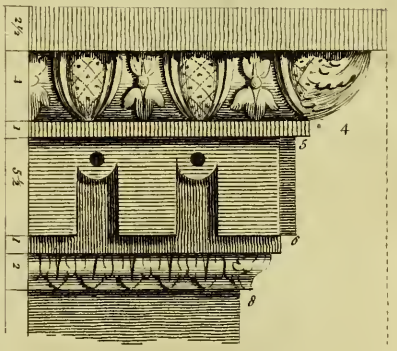
Bases & Sub-bases for Rooms.

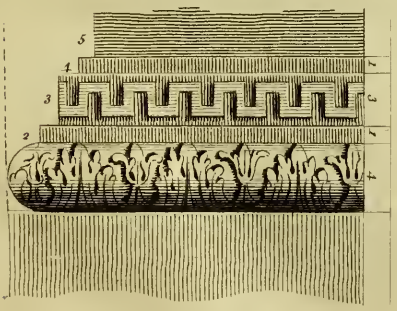






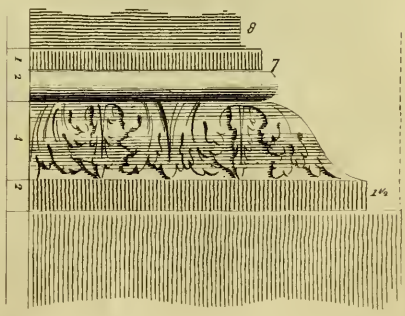
4 inches into 16 parts

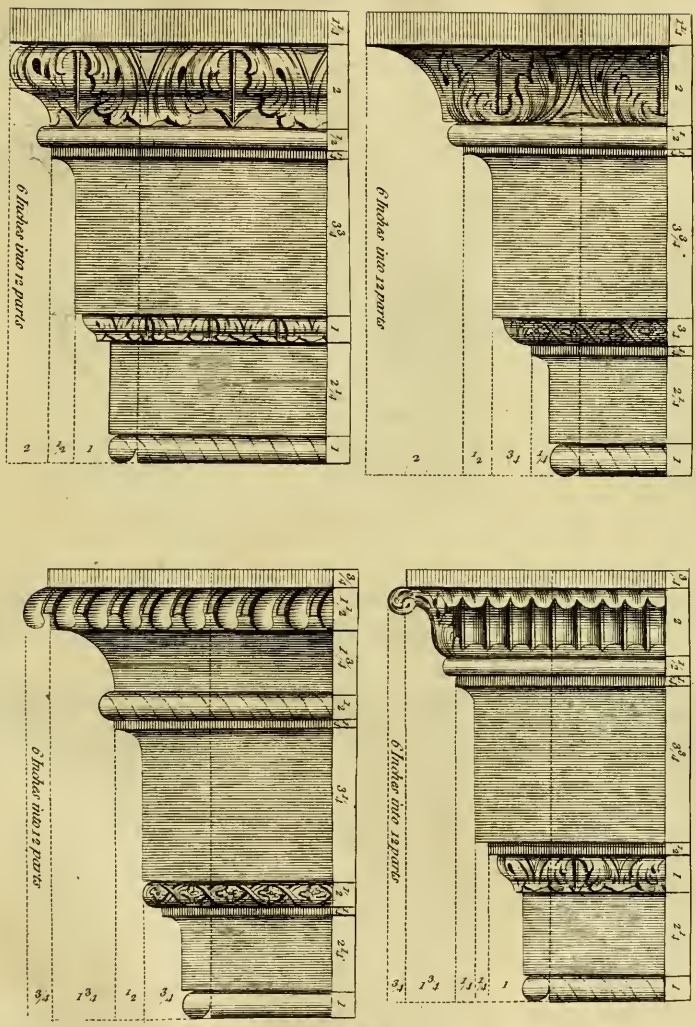




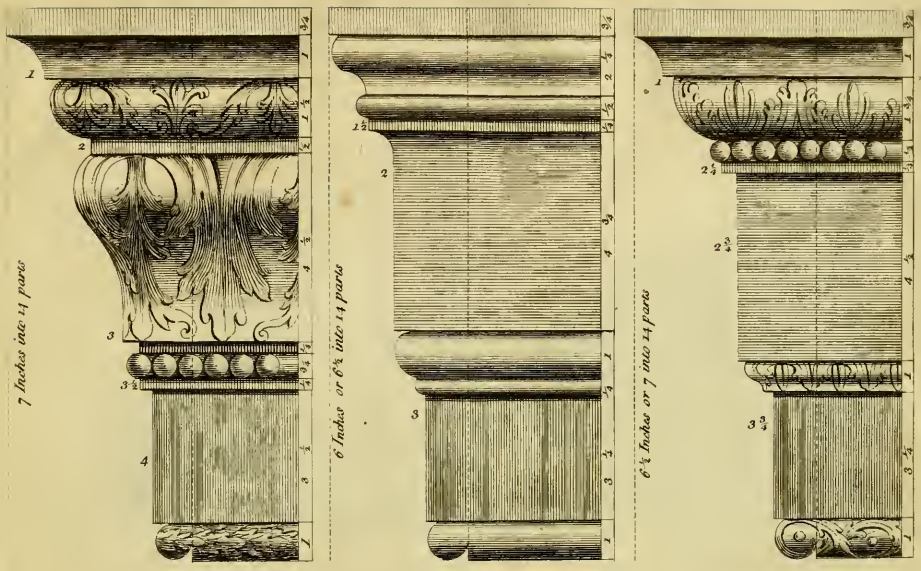
2 inches diam

2 ¼ inches into 9 parts

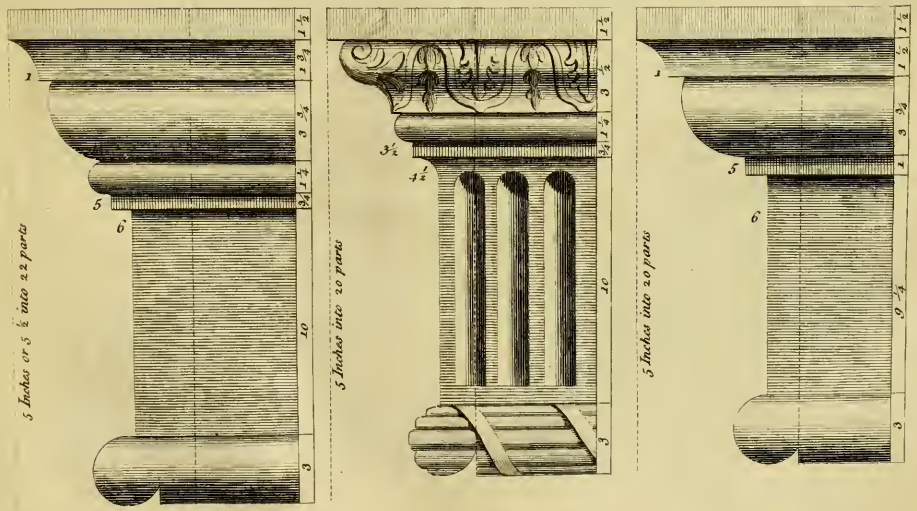


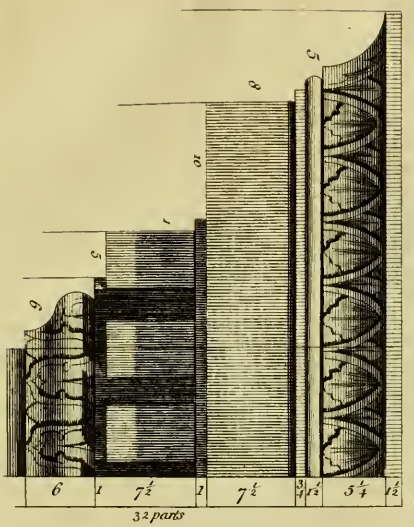


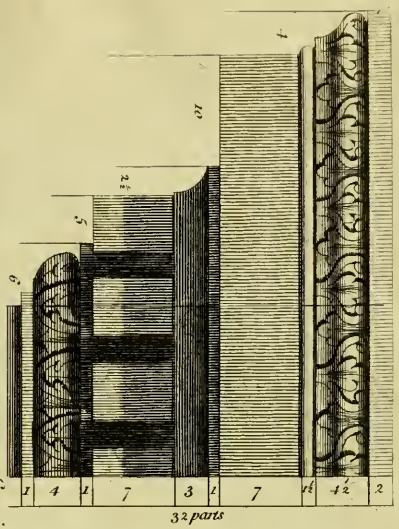
Architraves for Doors Windows &c. at large.

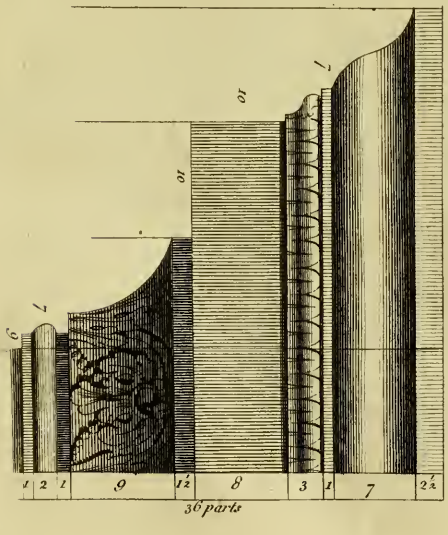


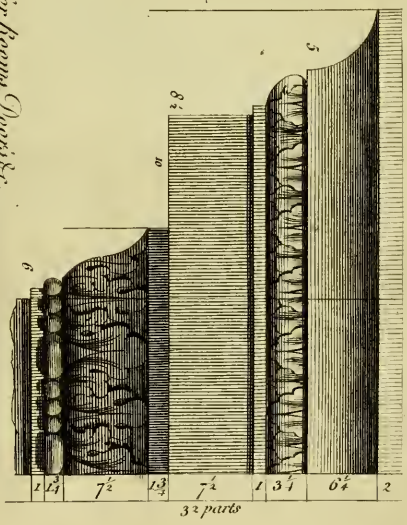
Architraves for Doors Windows &c.





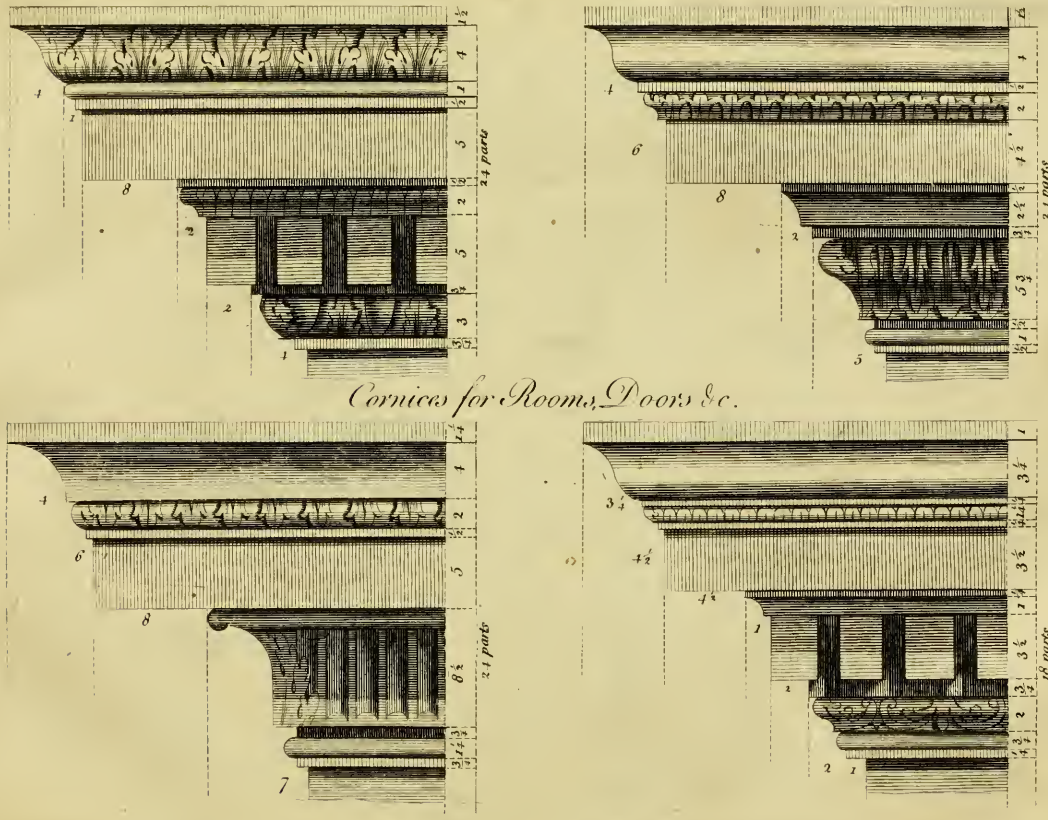






Cornices for Rooms, Doors &c.

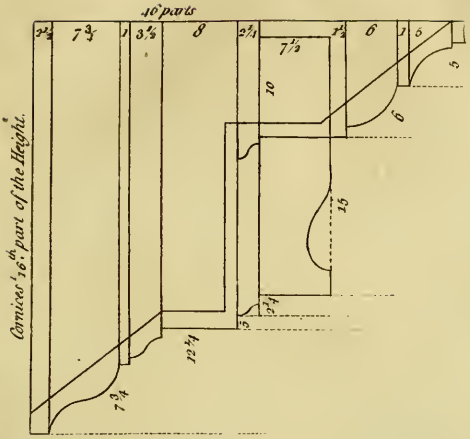
Plate LX.

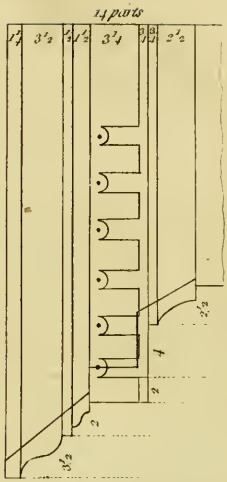


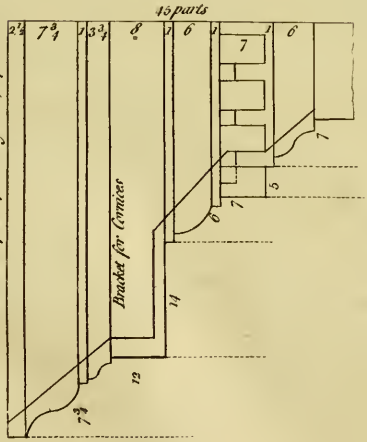
Cornices for Rooms, Doors &c.

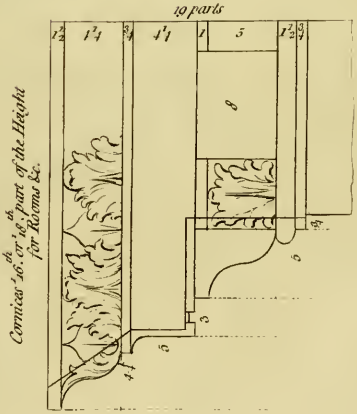
For Rooms $\frac{1}{18}$ part of the whole height. For Doors from 6 to 7 inches.
For Chimneys from 4 inches to 4 $\frac{1}{2}$.

Cornices for Rooms &c.





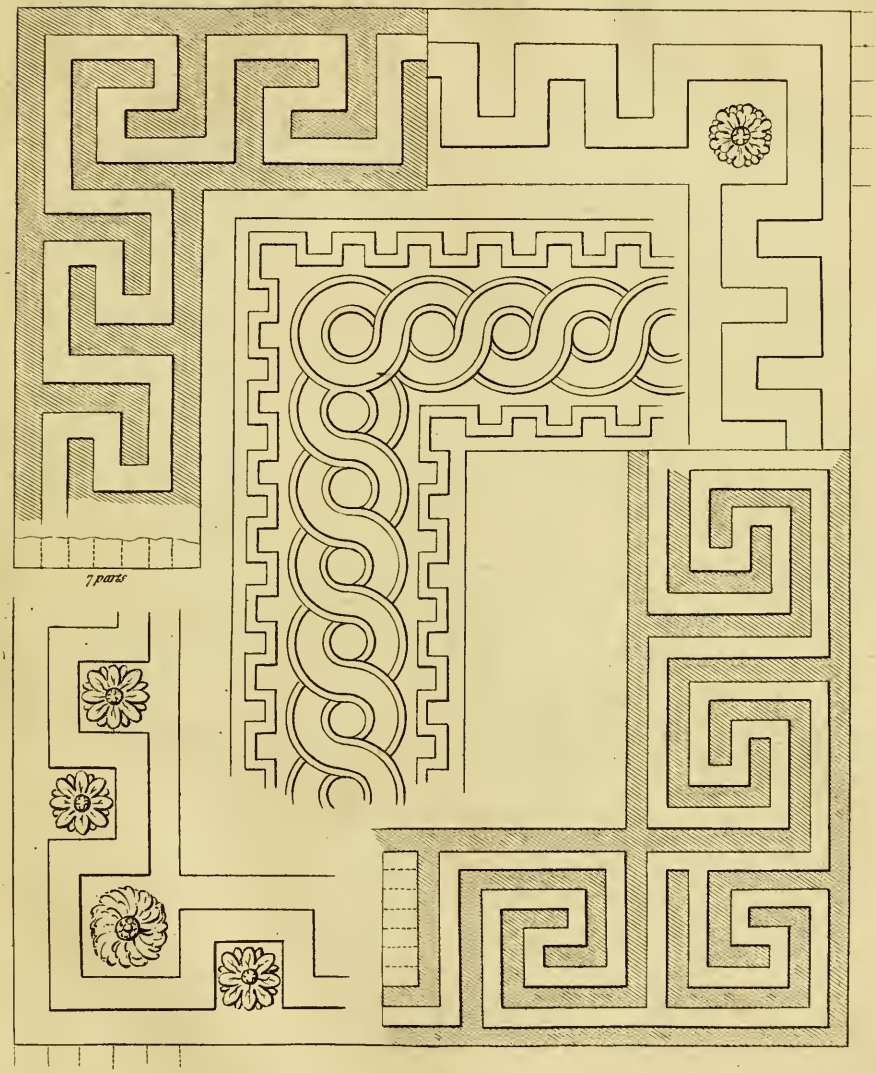




Two Designs
for Ceilings.

Two Designs for Ceilings.

Frets & Guiloches.



Frets.

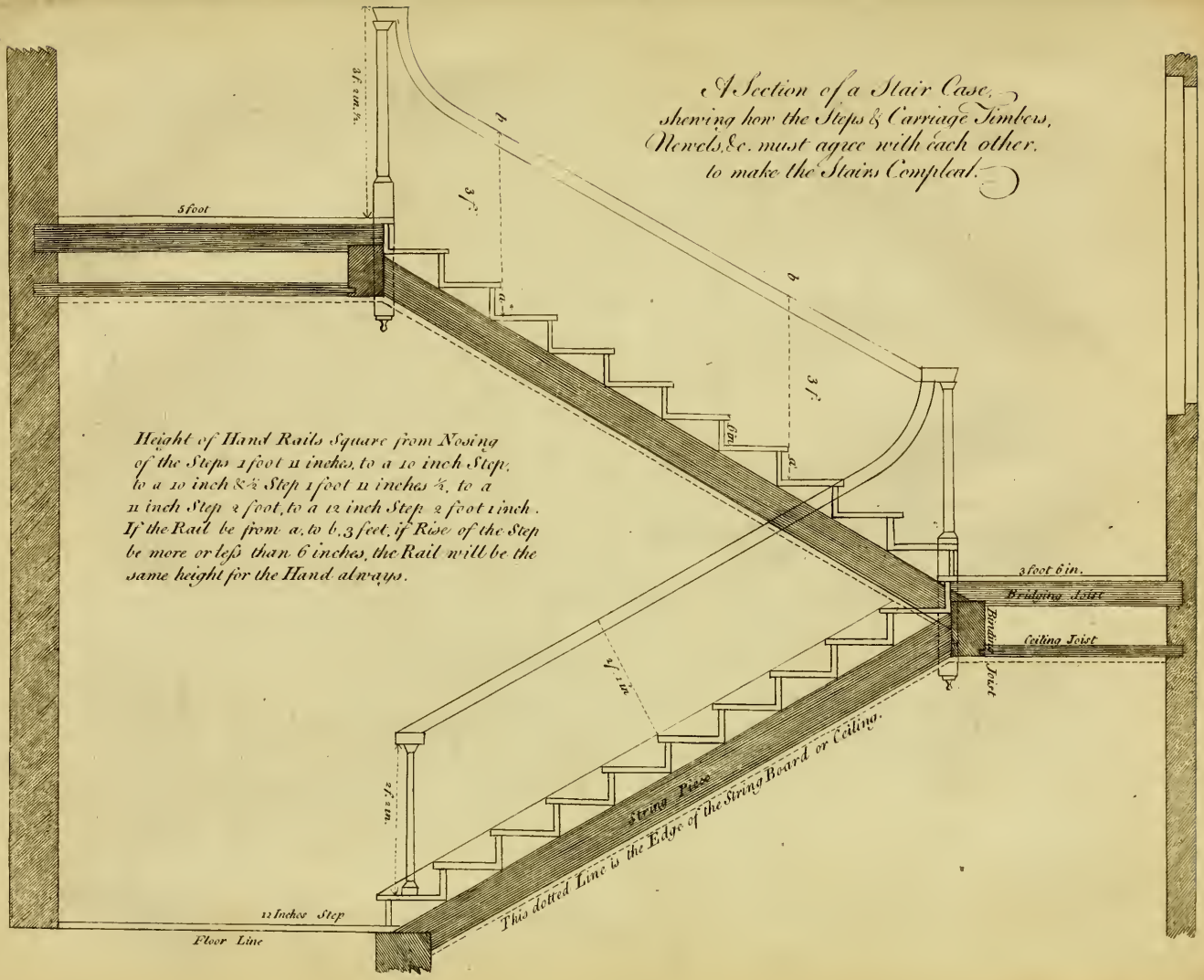
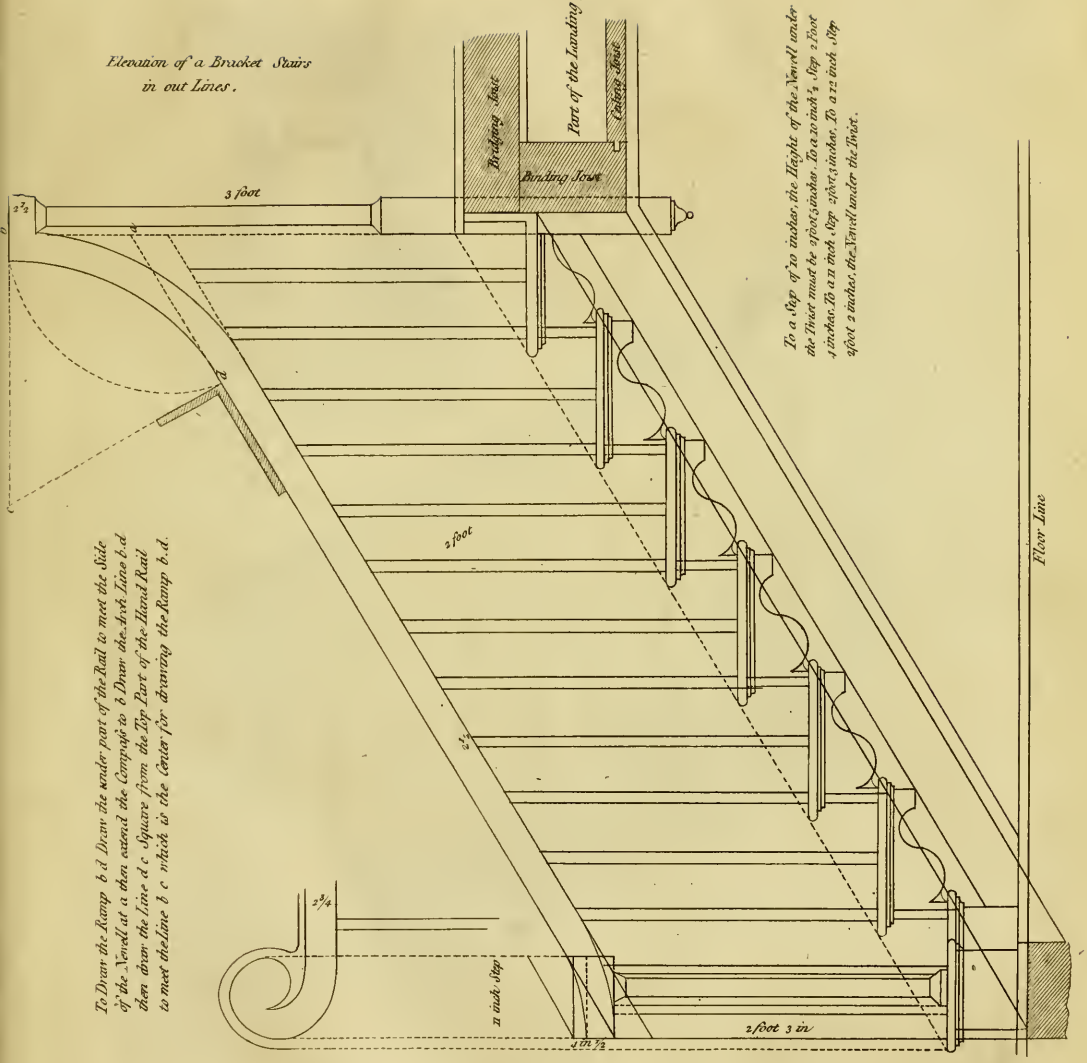
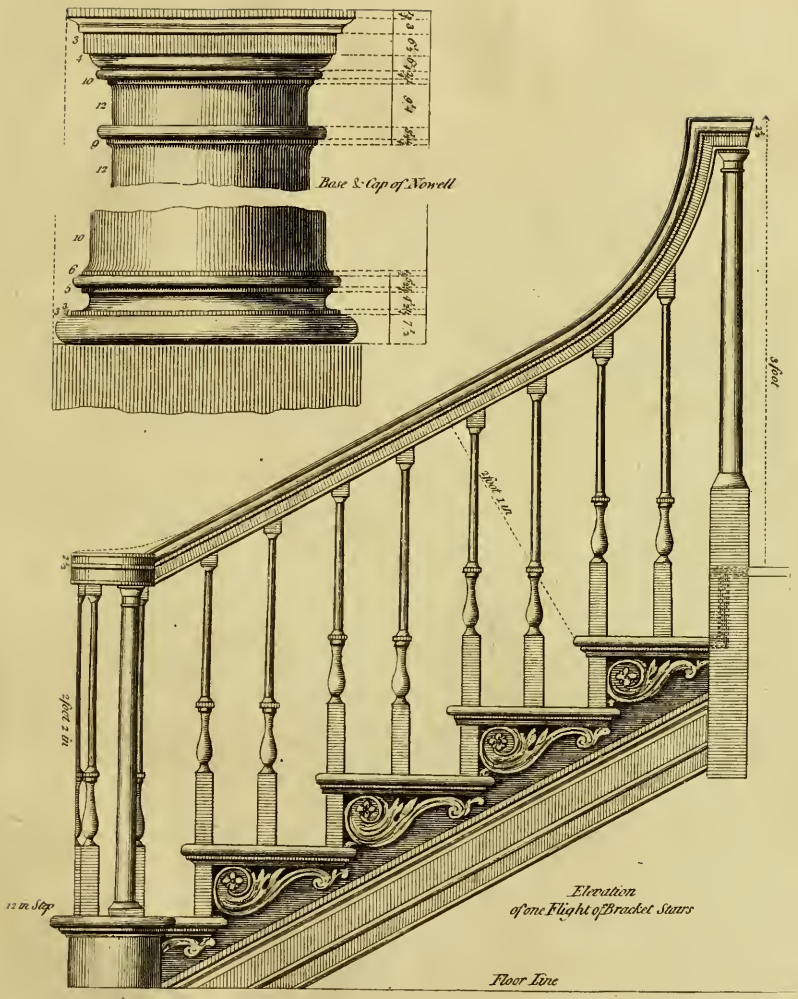

A Section of a Stair Case,
shewing how the Steps & Carriage Timbers,
Newels, &c. must agree with each other,
to make the Stairs Compleat.
3 foot
3 foot
3 foot
3 foot 6 in.
Bridging Joist
Ceiling Joist
Binding Joist
Height of Hand Rails Square from Nosing
of the Steps 1 foot 11 inches, to a 10 inch Step,
to a 10 inch & ½ Step 1 foot 11 inches ½, to a
11 inch Step 2 foot, to a 12 inch Step 2 foot 1 inch.
If the Rail be from a, to b, 3 feet, if Rise of the Step
be more or less than 6 inches, the Rail will be the
same height for the Hand always.
String Piece
This dotted Line is the Edge of the String Board or Ceiling.
12 Inches Step
Floor Line

Plate LXVI


Elevation of a Bracket Stairs in out Lines.
Bridging Joist
Part of the Landing
Ceiling Joist
Binding Joist
3 foot
2 foot
2 foot 3 in
11 inch Step
Floor Line
To Draw the Ramp b d Draw the under part of the Rail to meet the Side of the Newel at a then extend the Compass to b Draw the Arch Line b d then draw the Line d c Square from the Top Part of the Hand Rail to meet the Line d c which is the Center for drawing the Ramp b d.
To a Step of 10 inches, the Height of the Newell under the Foot must be 2 foot 3 inches. To a 10 inch 1/2 Step 2 Foot 3 inches. To a 11 inch Step 2 foot 3 inches. To a 12 inch Step 2 foot 2 inches, the Newell under the Foot.

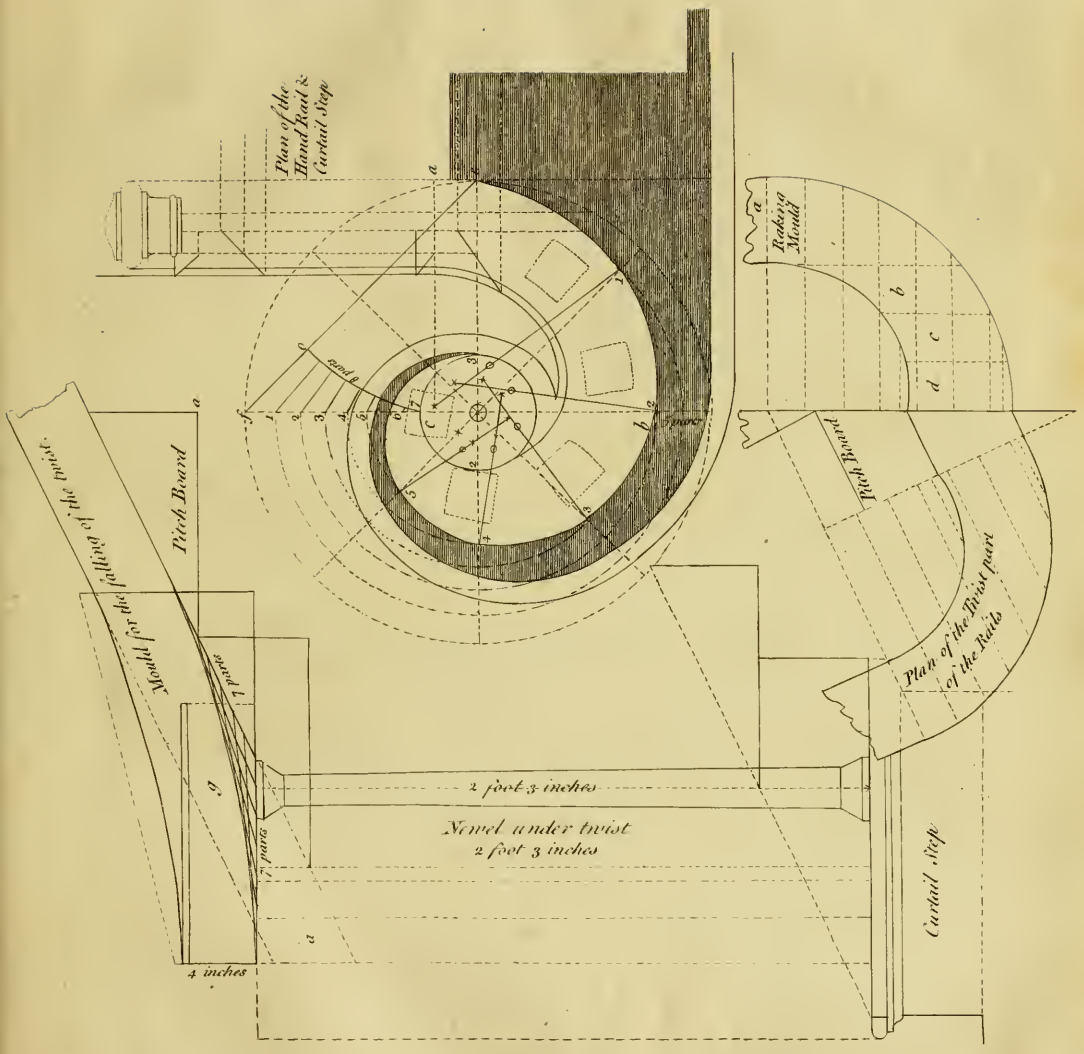

3
4
10
12
9
12
Base & Cap of Newell
10
6
3
3
Floor
Floor Line
Floor Line
Floor Line
12 in Step
Elevation
of one Flight of Bracket Stairs

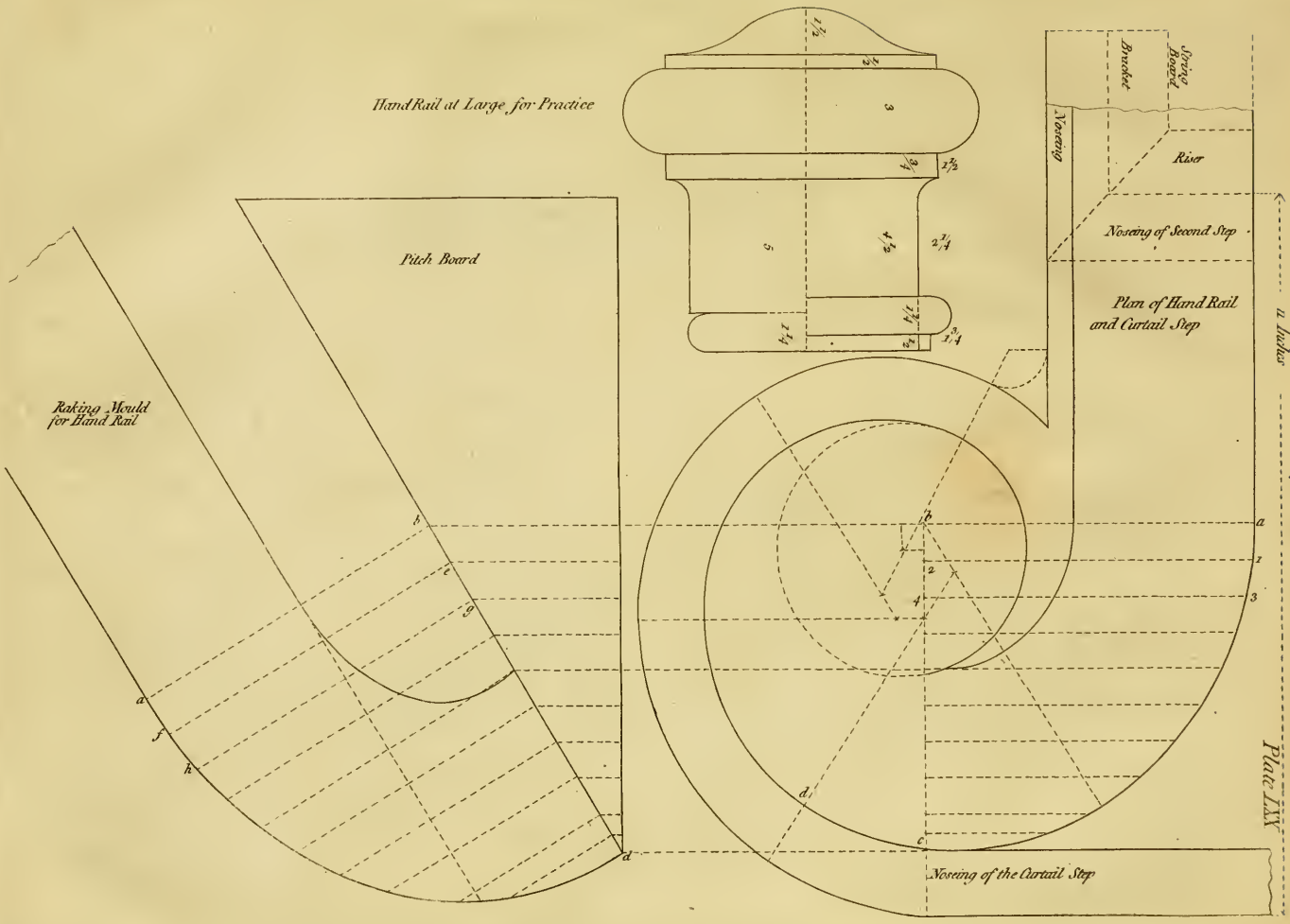
To face PLATE LXIX.

To draw the Plan and Scroll of a twiſt Rail for a Stair-Caſe.

DRAW a Circle equal to the Breadth of two Steps, and divide it into eight Parts, then draw a Circle round the Centre five Inches Diameter, as 2, 3, then draw the Line *e*, *f*, and ſet one Foot of the Compaſs at *e*, and draw the Arch Line 7, 0, which muſt be divided into eight Parts, and draw Lines from *e*, thro' each eighth Part to the Line 1, 2, 3, 4, 5, &c. then ſet the Compaſs in the Centre of the Scroll, and draw the dotted Lines from 1 on the Scale to 1 on the Edge of the Rail, and from 2 to 2 on the Edge of the Rail, and ſo for all the Reſt to each eighth Part of the Circle, which gives the outer Edge of the Rail.

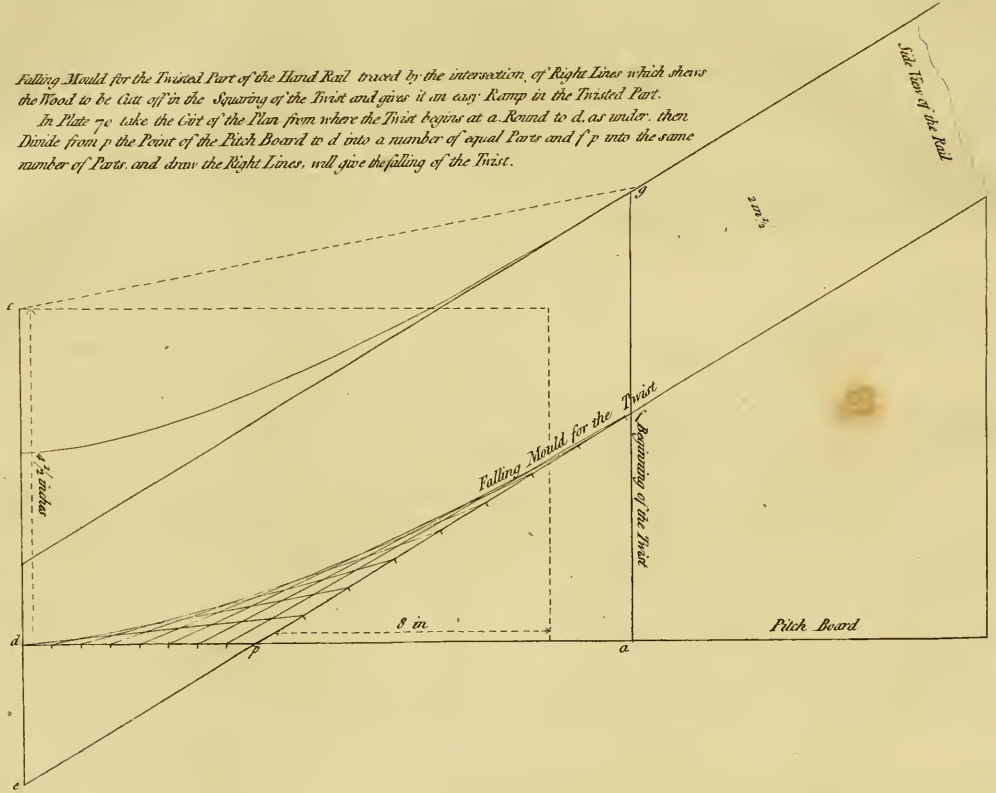
To find the Centre for drawing each eighth Part, ſet one Foot of the Compaſs in the Centre of the Scroll, and take the Diſtance to *f*, with the ſame Radius; ſet the Foot at *e*, and make a Mark at *c*, and with the ſame Radius ſet one Foot at 1 on the Edge of the Rail, and biſect the former Stroke at *c*, which is the Centre for the firſt eighth Part, then take from the Centre of the Scroll to 1 on the Scale, and ſet one Foot at 1 on the Edge of the Rail, make a Mark in the Eye and move the Compaſs to 2 on on the Edge of the Rail, and biſect the former Stroke, that is the Centre for the ſecond eighth Part, and ſo on for all the Reſt. The Centre for the Front of Riſer and Noſing of Step are the black Dots, one fifth Part from the Rail to the Noſing of the Step without the other Centre; the Pieces which make the twiſt Part of the Rail are *d*, *e*, *b*, on the raking Mould the Twiſt begins at *a* on the Edge of the Rail, and Ends at three on ditto, the remaining Part is level; the lower Part of the Scroll from 2 is cut out of a Parallel Piece, as repreſented by *g* on the Newel, &c.


Plan of the Hand Rail & Curtail Step
Raking Mould
Pitch Board
Mould for the falling of the twist
Pitch Board
Plan of the Twist part of the Rails
2 foot 3 inches
Newel under twist
2 foot 3 inches
Curtail Step
4 inches

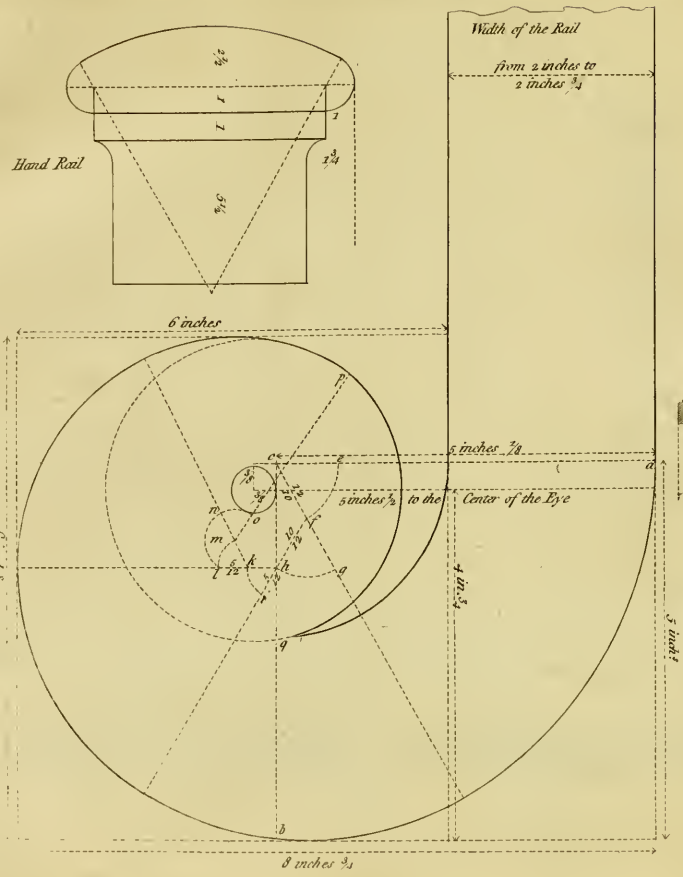

Hand Rail at Large for Practice
Pitch Board
Raking Mould for Hand Rail
Plan of Hand Rail and Curtail Step
Nosing of Second Step
Riser
Nosing
Bracket
String Board
Nosing of the Curtail Step
a Jaske
Plate LIX

Falling Mould for the Twisted Part of the Hand Rail traced by the intersection of Right Lines which shews the Wood to be Cut off in the Squaring of the Twist and gives it an easy Ramp in the Twisted Part.

In Plate 7e take the Cut of the Plan from where the Twist begins at a. Round to d, as under. then Divide from p the Point of the Pitch Board to d into a number of equal Parts and f p into the same number of Parts. and draw the Right Lines, will give the falling of the Twist.



The Twist Rail with its Measures exactly figured.



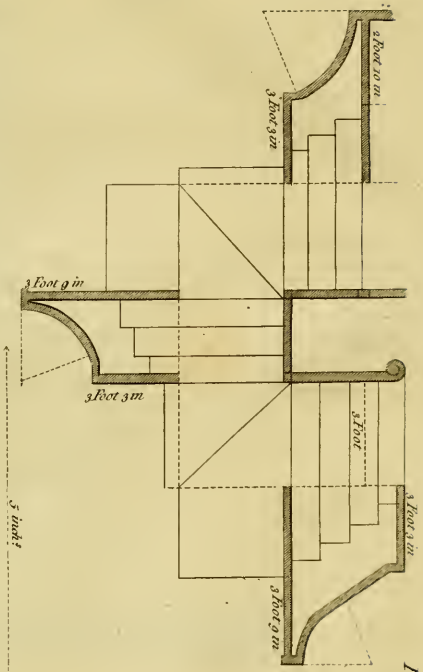
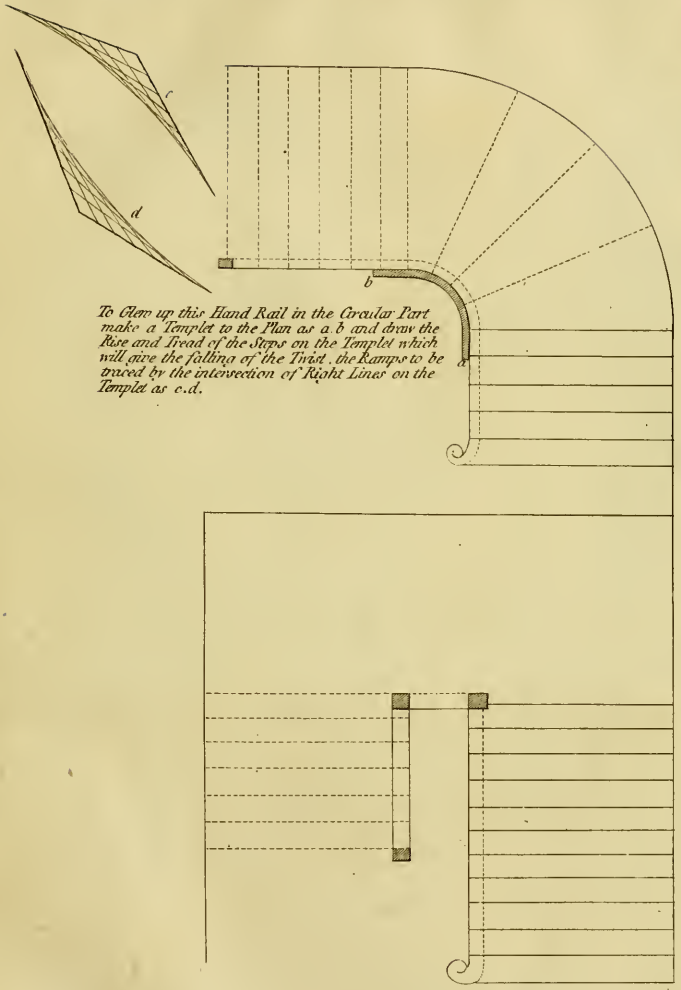


Plate LXVII.

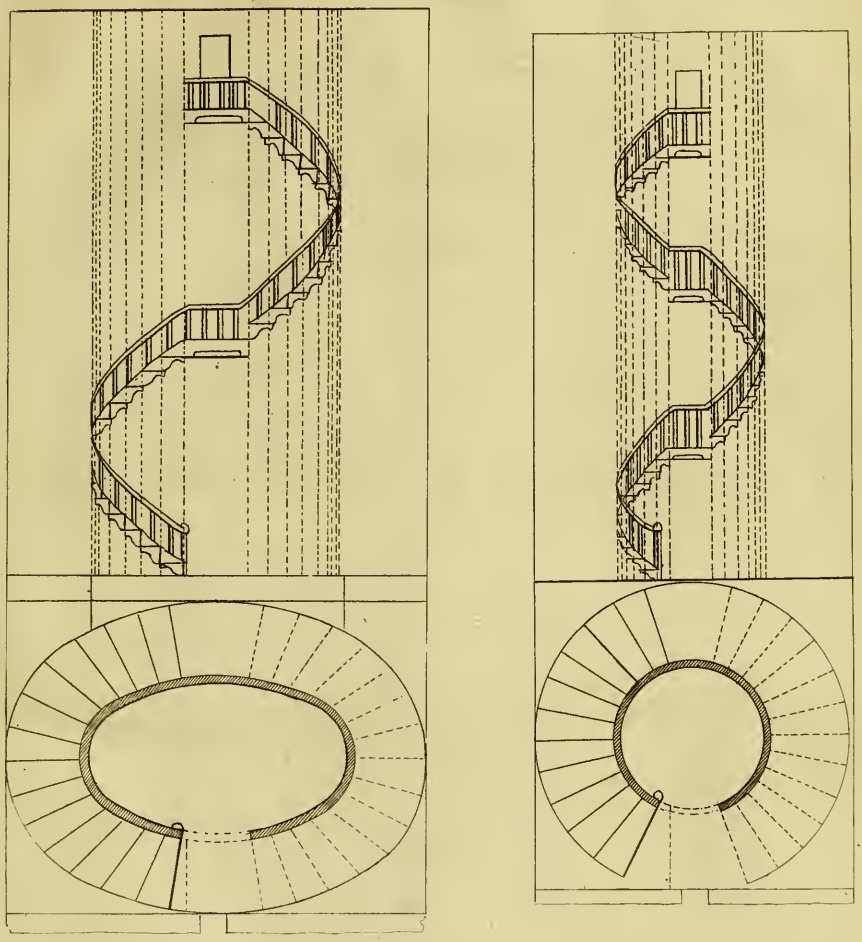
Two Plans for Stair Cases.



To Glew up this Hand Rail in the Circular Part make a Templet to the Plan as a b and draw the Rise and Tread of the Steps on the Templet which will give the falling of the Twist, the Ramps to be traced by the intersection of Right Lines on the Templet as c.d.

Bannister for Stairs.

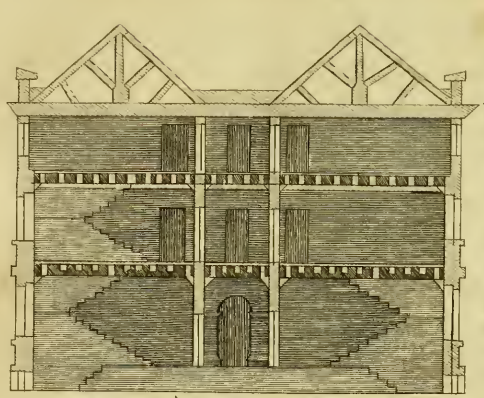
Plan & Elevation of a Circular & Oval Stair Case. Plate LXXV.

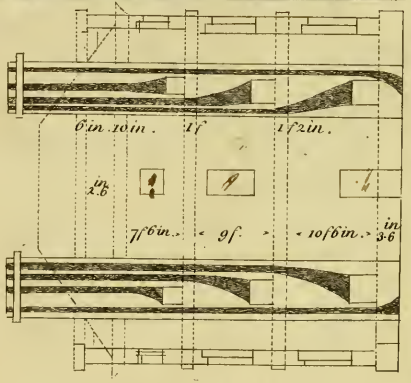


To be lighted by a Dome or Cone Lanthorn at the top, if placed in the middle of a Building. If on the outside may be lighted by Windows in the Wall at each landing.

To make the Hand-rail make a Templet or Cylinder to the well hole or open of the Rails, draw the tread & rise of each Step on the Cylinder, and that will give the falling of the Rail, which is to be gleved in thickness bent round the Cylinder, then the Rail will come off ready squared, this is a very sure way to make the Rail.

Plan, Elevation & Section of a Gentleman's House, the Offices being in the Basement Story.





Section of the Chimney Flews.

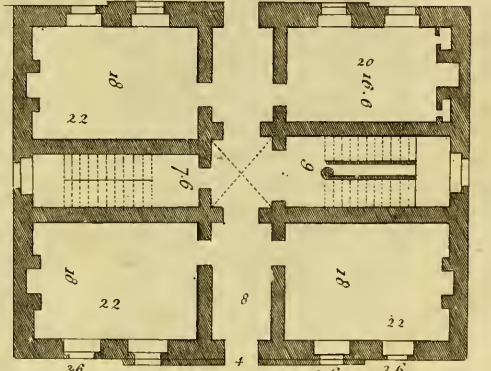
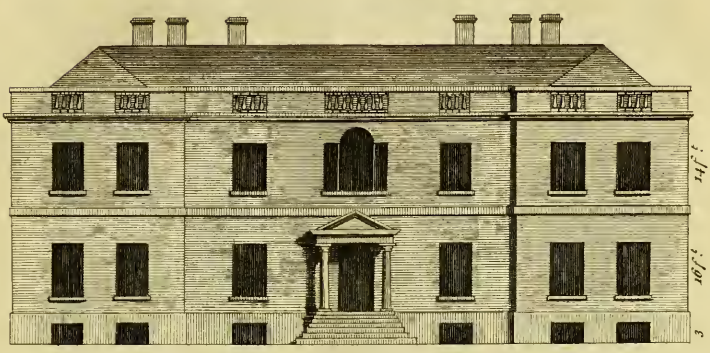
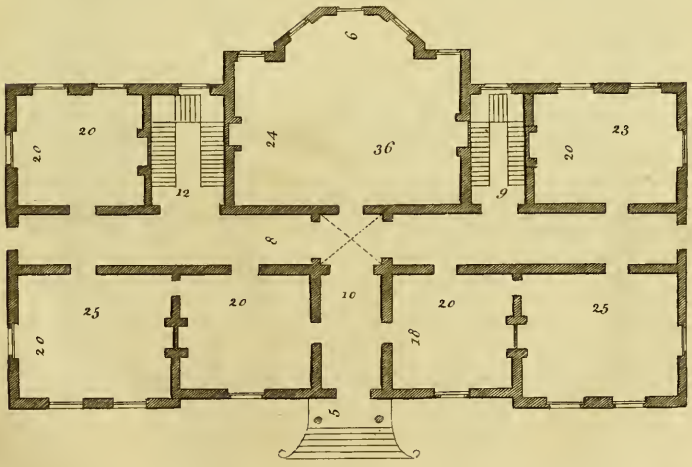


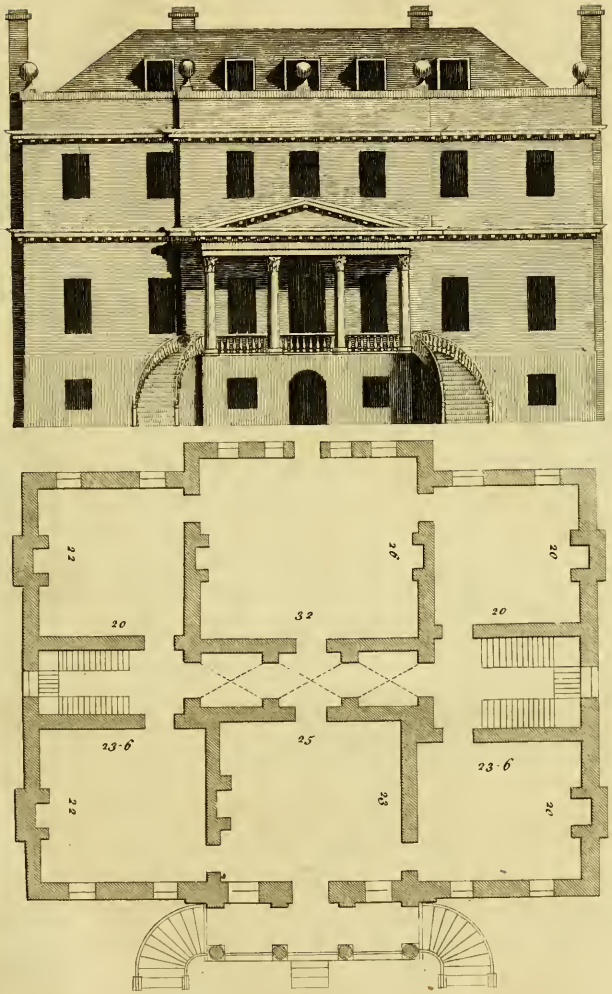
Plate LXV.

Plan and Elevation of a Gentleman's House.

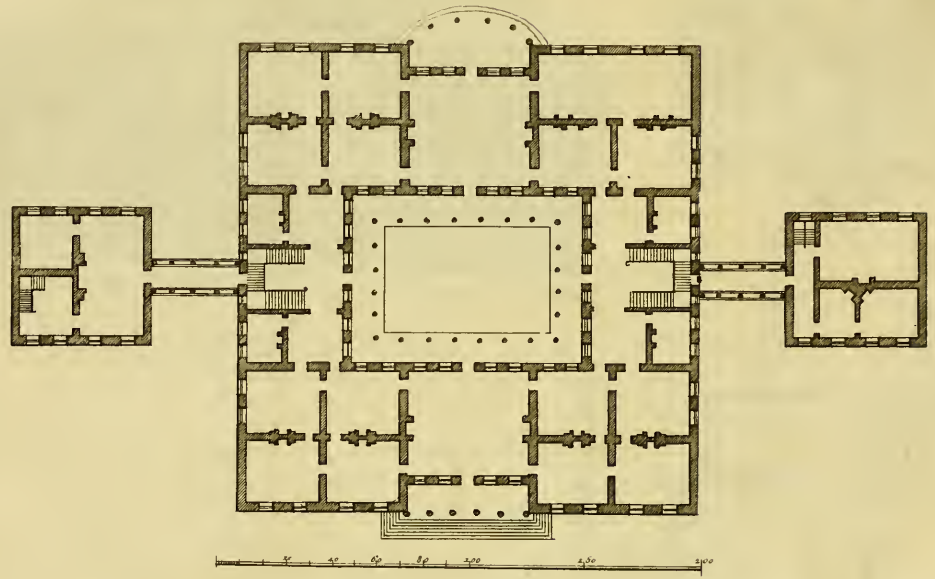


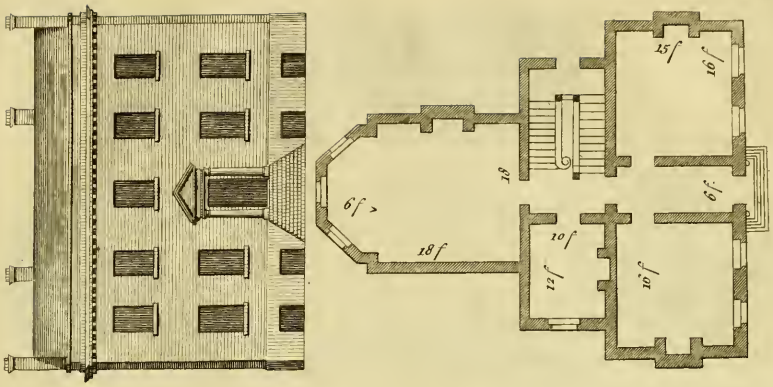


Plan & Elevation of a Gentlemans House.

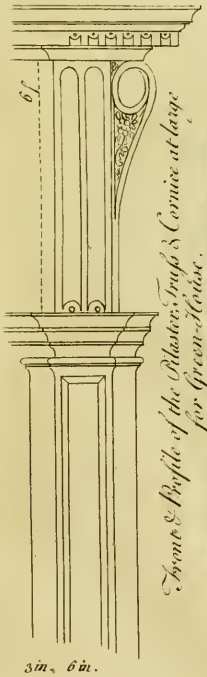


Plan & Elevation of a House for a large Family.

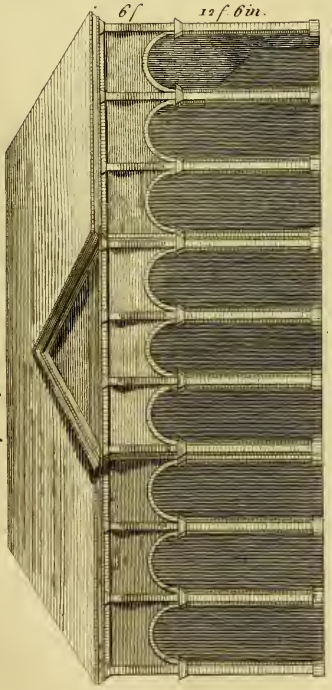


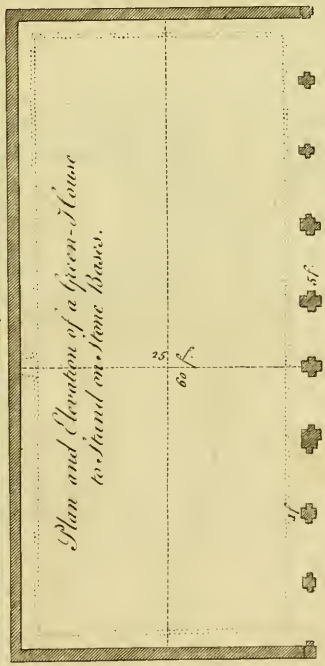


Plan and Elevation for a Dwelling-House.

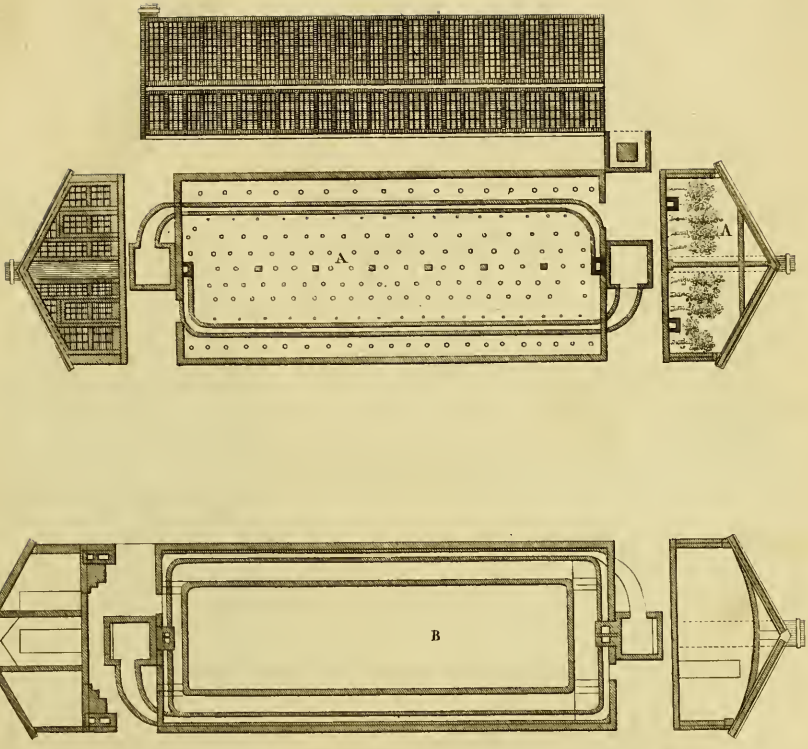


Front & Profile of the Plinths, Trigly & Cornice at large for Great-Holes.





Plan and Elevation of a Green-House to stand on Stone Bases.



Two Plans, Elevations and Sections for Stoves or Hot Houses for Pines, Fruit Trees, Strawberrys &c.

The Plan and Section A is for Fruit Trees.
The Plan B, for Pines; the Flews in this Plan run one over another as may be seen in the Section. There are Fire Places at each End and a Walk all round.
The Flews in the Plan A. Run on the Surface and are single Flews.
The Front Roof and Ends Glass as the Elevation of the Plan A.
The Width of each House is 16 Feet the Length at Pleasure from 40 to 50 Feet. or more at pleasure.

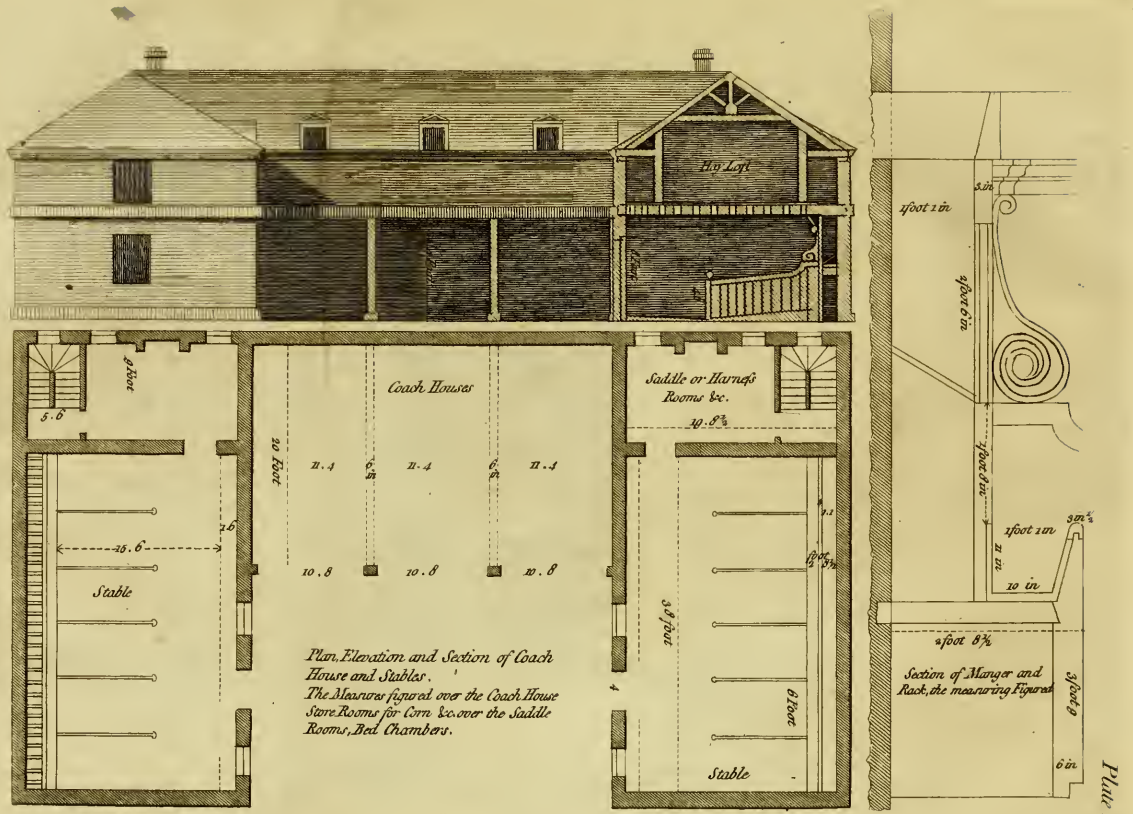
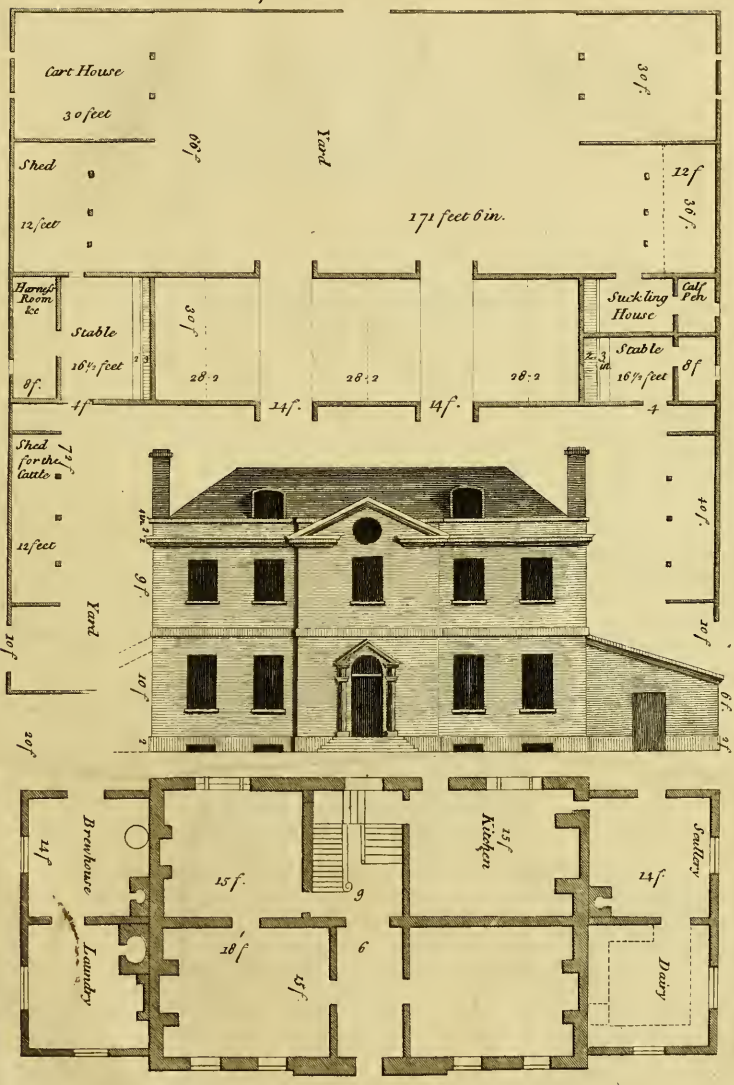
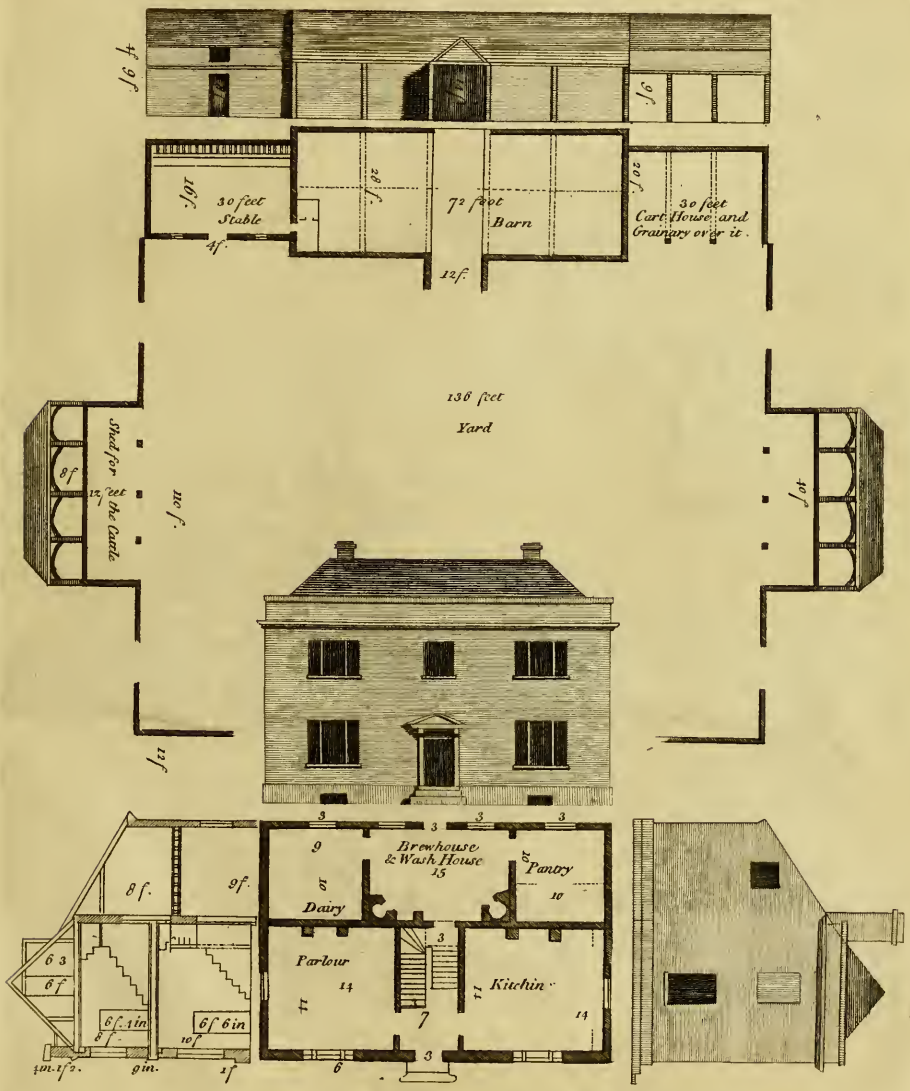

Hay Loft
Coach Houses
Saddle or Harness Rooms &c.
Stable
Stable
Plan, Elevation and Section of Coach House and Stables.
The Measures figured over the Coach House Store Rooms for Corn &c. over the Saddle Rooms, Bed Chambers.
Section of Manger and Rack, the measuring Figures

Plate LXXI.


Cart House
30 feet
30 f.
Shed
12 feet
Yard
171 feet 6 in.
12 f.
36 f.
Horse Room &c
Stable
16½ feet
28: 2
Sucking House
Calf Pen
Stable
16½ feet
8 f.
4 f.
14 f.
Shed for the cattle
12 feet
Yard
10 f.
20 f.
Brewhouse
Laundry
15 f.
18 f.
15 f.
9
6
Kitchen
Scullery
Dairy

Plan, Elevation & Section &c. of a Farm-house Barns, Stables &c.



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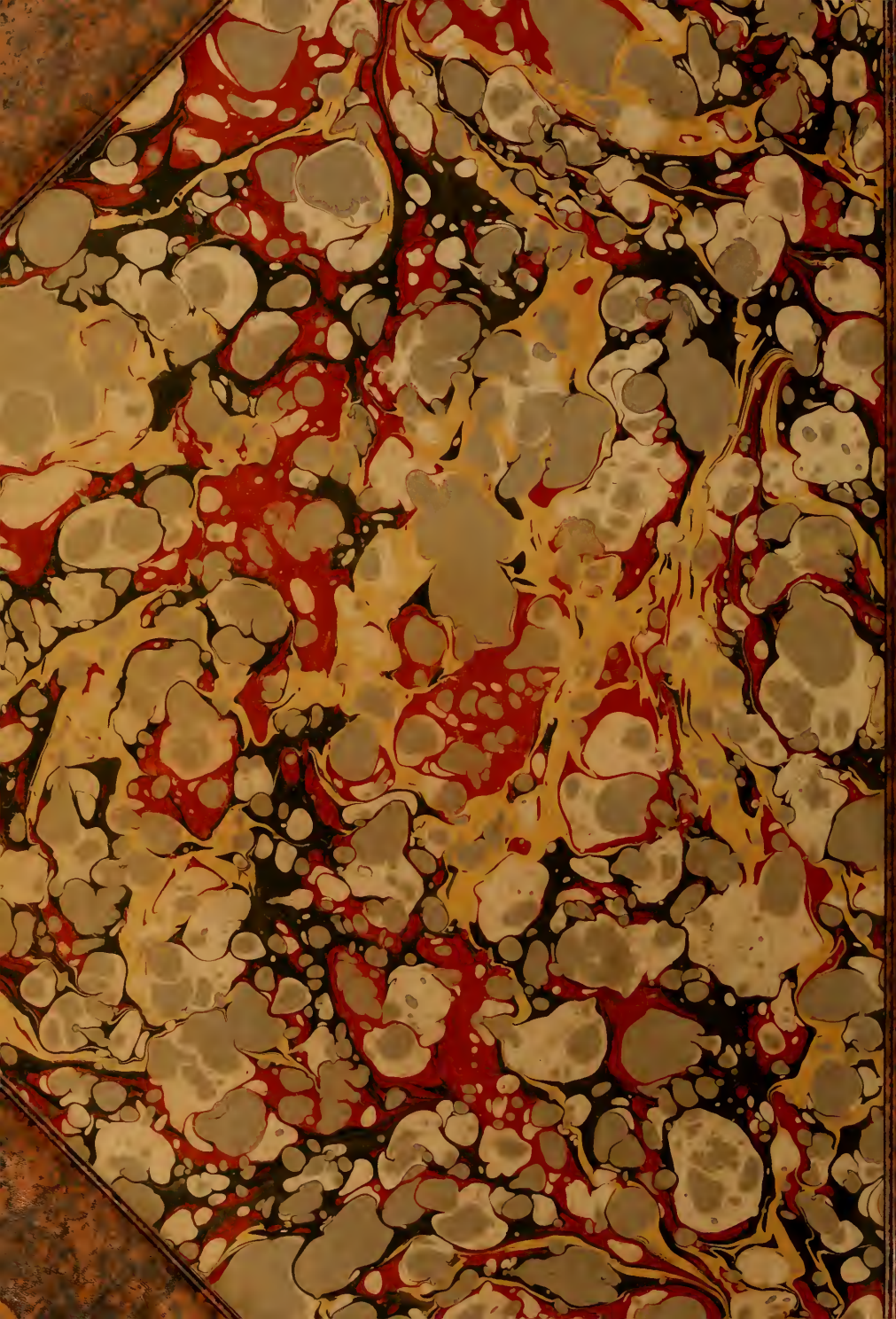
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